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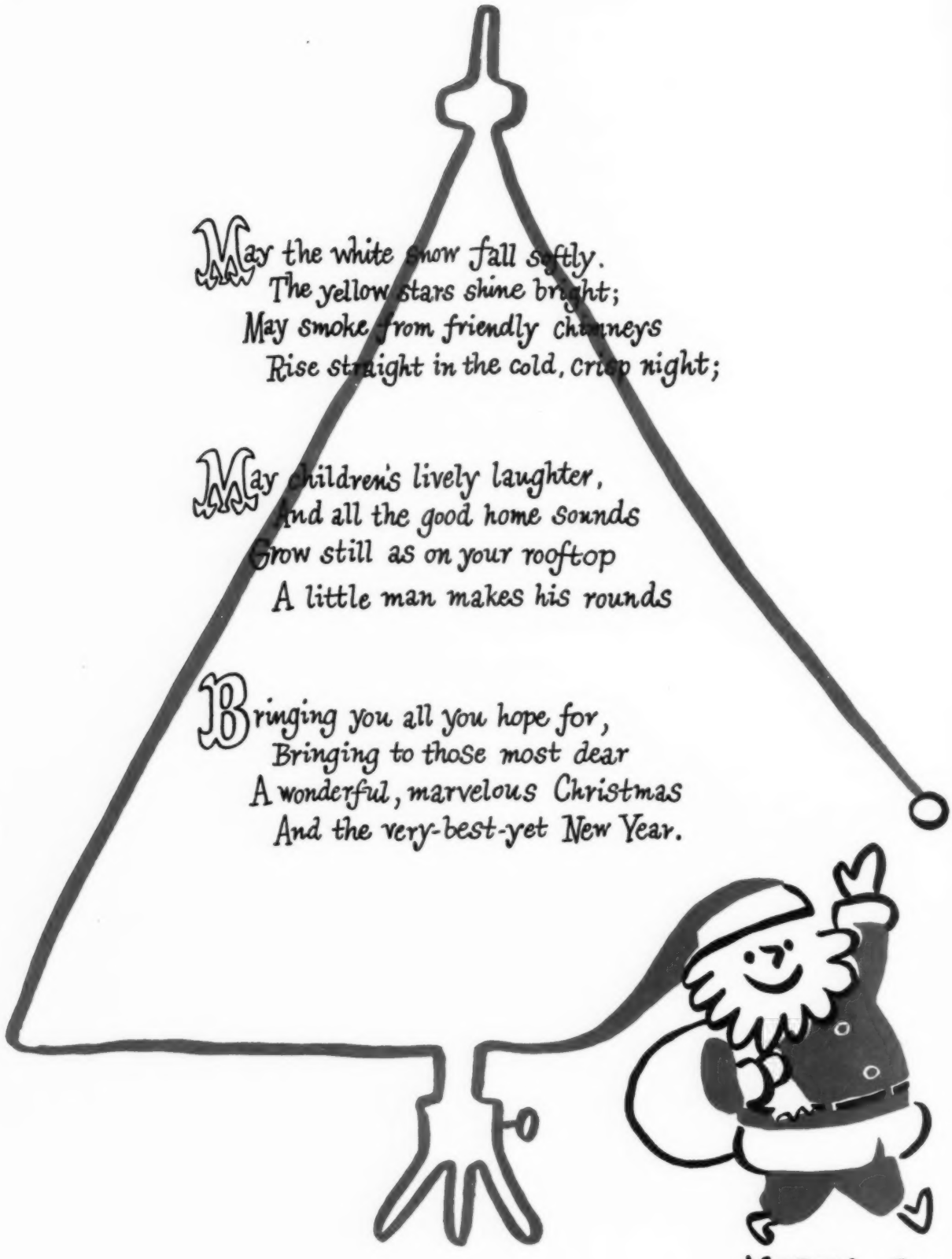
Drug and Cosmetic Industry

DECEMBER 1954

May the white snow fall softly.
The yellow stars shine bright;
May smoke from friendly chimneys
Rise straight in the cold, crisp night;

May children's lively laughter,
And all the good home sounds
Grow still as on your rooftop
A little man makes his rounds

Bringing you all you hope for,
Bringing to those most dear
A wonderful, marvelous Christmas
And the very-best-yet New Year.



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Shaving

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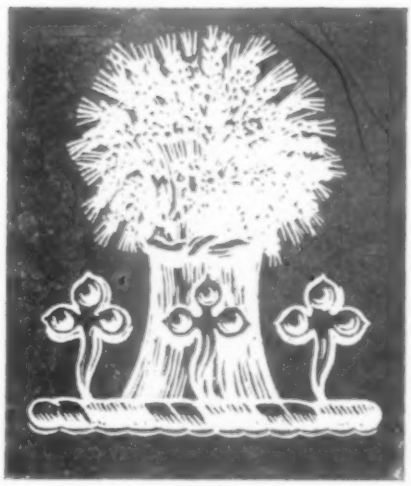

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36-14 35th Street

Long Island City 6, New York

Drug and Cosmetic Industry

December 1954 Vol. 75 No. 6

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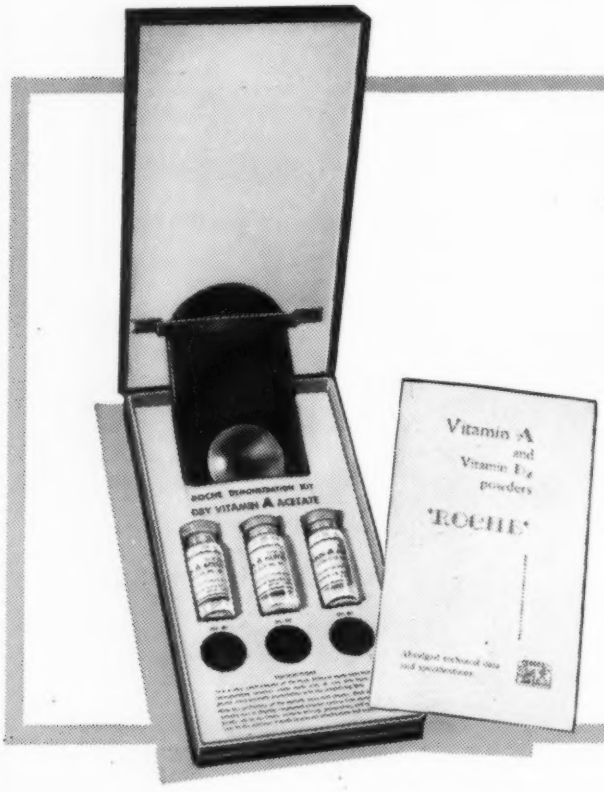
Stanolind Petrolatum Dark

STANDARD OIL COMPANY STANDARD *(Indiana)*

Why you should use ROCHE

1 *HIGH STABILITY*—Tests of Roche vitamin A acetate powder alone and in combination with Roche vitamin D_2 powder and other dry vitamins, minerals, fillers, lubricants and flavors, under manufacturing conditions show that Roche dry vitamin A has excellent stability in coated and uncoated tablets, in hard and soft gelatin capsules, and in powdered products. Other tests of Roche vitamin A and vitamin D powders stored in open containers under accelerated aging prove that these products have an extraordinarily high potency retention. Special precautions in handling are unnecessary.



2 *LIGHT COLOR...FREE FLOWING.*

Roche dry vitamin A is a light yellow color. It is produced as spherical granules having an irregular surface. It flows freely. The granules contain finely dispersed vitamin A acetate of high purity in a starch-coated protective matrix to avoid atmospheric oxidation. It is practically odorless and tasteless.

Prove it yourself, get the ROCHE demonstration kit

Prove to yourself the excellent color and uniform particle size of Roche dry vitamin A acetate with this simple demonstration. Kit also contains abridged version of the new Roche dry vitamin A technical brochure to give you quick facts about the product. We shall be glad to send you one of these free kits at your request. Or ask your Roche salesman.

3 *VARIOUS POTENCIES and COMBINATIONS*

Roche dry vitamin A acetate alone, or in combination with Roche dry vitamin D_2, will give you easier manufacturing of dry preparations: tablets, capsules, vitamin-fortified powdered supplements. See the table below for the many potencies and mesh sizes which Roche has to help you. Designated potencies are confirmed by U. S. P. assay methods.

ROCHE DRY Vitamin A acetate			ROCHE DRY vitamin A acetate and vitamin D_2 COMBINATIONS			ROCHE DRY Vitamin D_2		
Type & Name	Potency in (U.S.P. units per gram)	Mesh Sizes	Type & Name	Potency in (U.S.P. units per gram)	Mesh Sizes	Type & Name	Potency in (U.S.P. units per gram)	Mesh Sizes
Type 325	325,000	40, 60 and 80	Type 325A–32.5D	A –325,000 D_2– 32,500	40 and 60	Type 850	850,000	40 and 60
Type 500	500,000	40, 60 and 80						
Type 250*	250,000	40, 60 and 80	Type 500A–50D	A –500,000 D_2– 50,000	40 and 60			

*Small inventories usually available

ROCHE VITAMINS BY THE TONS

ROCHE

ROCHE DRY

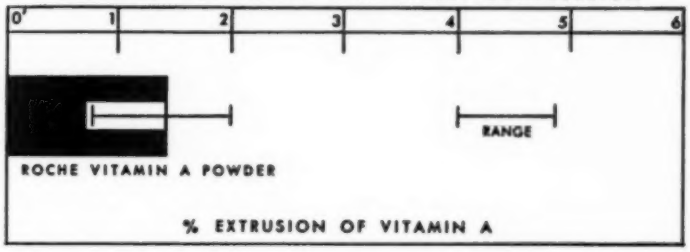
DRY VITAMIN A acetate

1 *UNIFORM PRODUCT.* The many years of experience which Roche has in vitamin research and manufacture insure the production of dry vitamin A which is uniform in potency, color and particle size.

5 *CONVENIENCE.* With its free-flowing character, easy combination with other dry ingredients, and starch-coated, irregular particle surface to prevent separation during mixing and sticking in tabletting machine dies, Roche dry vitamin A is ideally suited for preparing coated and uncoated tablets, hard and soft gelatin capsules and dry formulations.

6 *LOW PROCESSING LOSS.* Roche dry vitamin A has excellent resistance to the high pressures found during tabletting. Thus you may make tablets virtually without loss of vitamin A potency during processing. The table (right) shows the extremely small percentage of vitamin A loss due to extrusion. The average extrusion loss is negligible.

EXTRUSION OF VITAMIN A IN TABLET COMPRESSION



7 *NO FISHY TASTE...* no fishy "burp" or after-taste will *ever* occur in any of your products made with Roche dry vitamin A.

8 *BIOLOGICAL AVAILABILITY.* Laboratory tests by rat liver storage assay and by U.S.P. rat curative growth assay show that Roche dry vitamin A acetate and dry vitamin D_2 have complete biological availability in the test animals.

9 *PACKAGING.* All types of Roche dry vitamin A acetate and Roche dry vitamins A and D_2 combinations are packed in polyethylene bags in fibre drums or 2-kilo Tamper-proof metal containers—to insure safe delivery and ease of handling and storage.

10 *SAMPLES* are yours on request. Just ask your Roche salesman or write the Vitamin Division.

NEW TECHNICAL BROCHURE NOW READY FOR YOU FREE

A complete, spiral-bound technical brochure on Roche dry vitamin A acetate is now being distributed. Containing 36 pages, illustrated, with data about biological availability, particle sizes, physical properties, analytical methods, assays and extrusion tests, this brochure can give you much help. Be sure to get your personal copy now. Just ask your Roche salesman or write the Vitamin Division. It's free.

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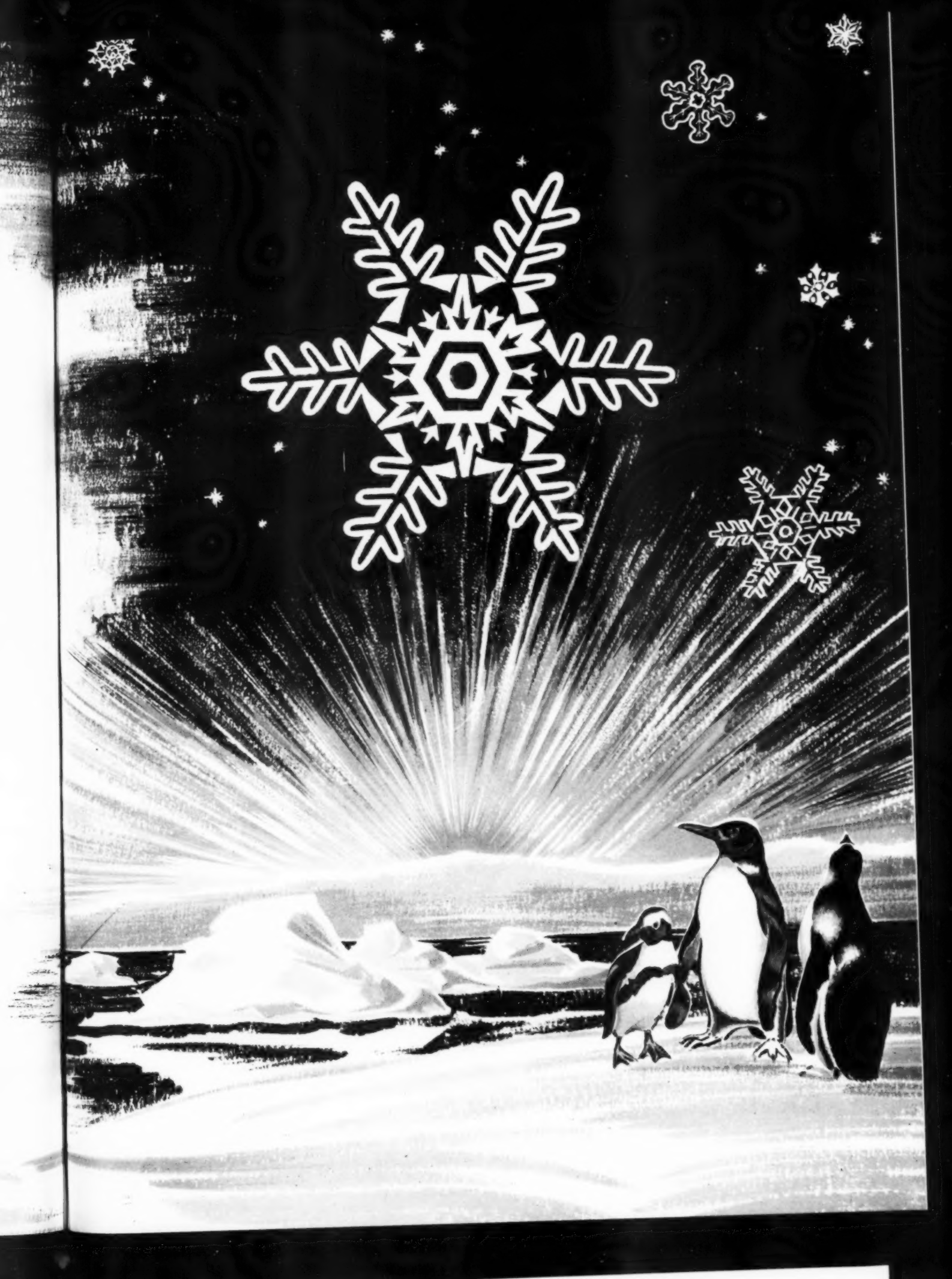

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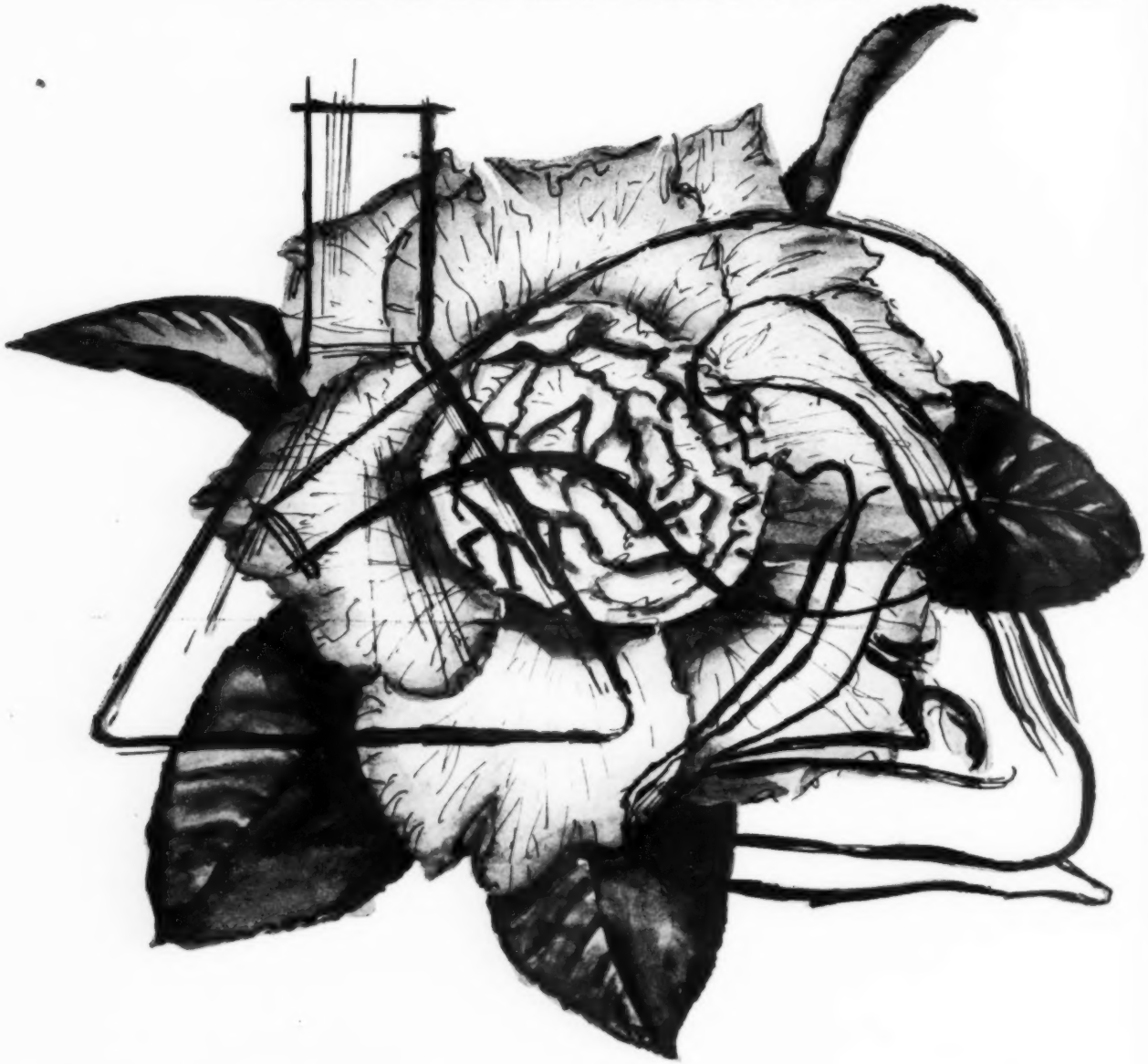

What Dictates the Choice of a Lipstick?

More women use lipstick than any other cosmetic, statistics tell us, and sales of lipsticks are constantly on the increase. What dictates a woman's choice of lipstick? . . . Is it the so-called "indelibility"; the smoothness, the lustre? . . . Is it the PERFUME? Undoubtedly the perfume of a lipstick is of utmost importance, appealing, as it must, to the taste as well as to the smell. The *right* scent should be strong enough to cover the inherent odors of the lipstick ingredients, yet not so strong as to conflict with other perfume used. It must be non-toxic, insured against oxidation and completely compatible. The marriage of lipstick and perfume is no easy task . . . one to be attempted only by so expert a match-maker as ROURE-DUPONT. Do not delay. Let us analyze your lipstick and find for it the ideal perfume mate to guarantee a top place for your product in the lipstick ranks.

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and a prosperous 1955

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We hope that our past pleasant relations
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ATLAS

CHEMICALS DEPARTMENT
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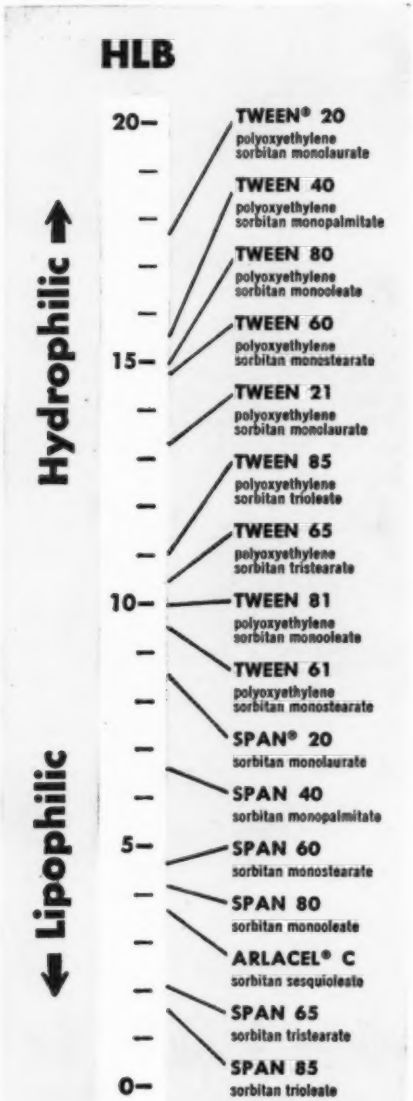
How to calculate HLB of surfactants



HLB values of typical Atlas non-ionic surfactants. High HLB values signify water-loving materials . . . low values are oil loving . . . values around 10 are intermediate.

Ever since Atlas introduced the HLB system for classifying surface active agents, chemists have found it an important time-saving technique for solving emulsion problems. For the first time, this method gave chemists a numerical scale by which emulsions and surfactants could be related, as a means of narrowing down the choice of surfactant for a given application.

Any laboratory man who has been confronted with the selection of a surfactant will appreciate the extent of this problem. Literally hundreds of surfactants are available. But they vary in their affinity for oil and water. The HLB system establishes a basis by which surfactants can be compared and their performance in an emulsion predicted.

The name HLB is an abbreviation for Hydrophile-Lipophile Balance . . . that is, the relative strength of the hydrophilic (water-loving) and lipophilic (oil-loving) portions of the surfactant molecule. The ability of these two opposite parts of the molecule to "hang on" to oil and water phases simultaneously determines the performance of the surfactant in an emulsion. Similarly, various emulsifiable materials . . . oils, waxes, etc. . . . require a surfactant with a definite HLB value to cause proper emulsification. Selection of a surfactant then becomes a matter of matching the HLB requirements of the emulsion with those of the surfactant.

Applicable to many surfactants

In the past, HLB values have been published primarily for materials manufactured by Atlas. The basic system, however, applies to a broad variety of surfactants. While a fairly involved and lengthy procedure is necessary to determine HLB numbers experimentally, for many basic chemical classes of surfactants, HLB can be calculated by empirical formulas. In this category are polyol fatty acid esters, tall oil and rosin esters, beeswax and lanolin esters, and fatty alcohol ethylene oxide condensation products.

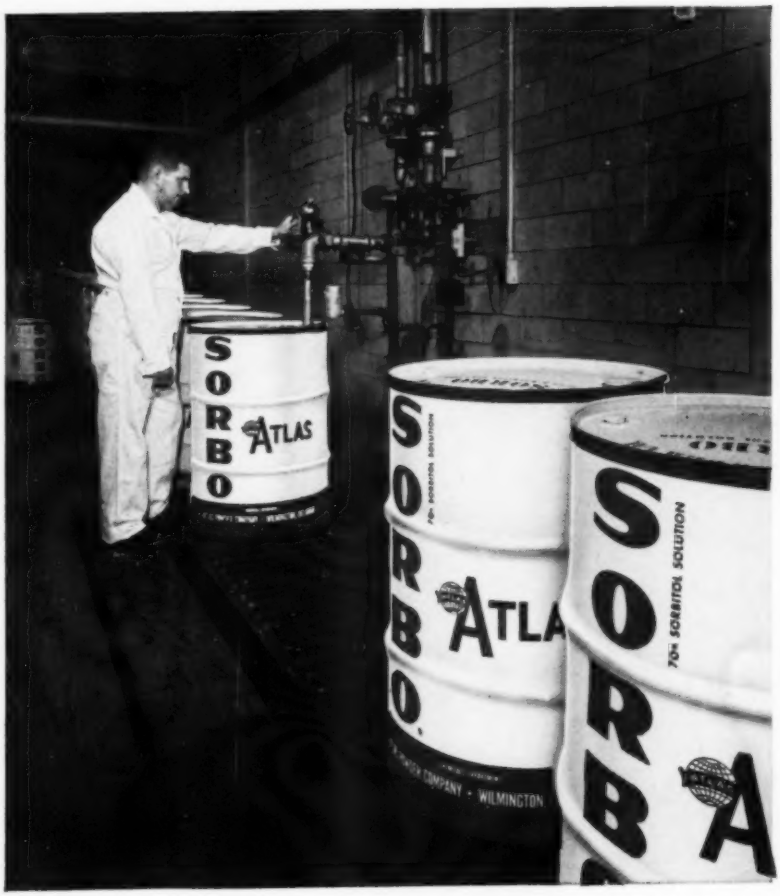
In most instances, the HLB number is related to the ratio of weight percentages of oil-soluble and water-soluble components. To calculate the value, you use data which most laboratories are equipped to obtain. The HLB values of polyol fatty acid esters, for example, are calculated by means of saponification number of the ester and acid number of the fatty acid. The HLB values of tall oil esters and rosin esters are figured from the weight percentage of oxyethylene content and polyol.

Pamphlet explains HLB Calculation

To broaden the usefulness of the HLB system, a pamphlet is now available outlining the methods of calculation for a number of typical non-ionic surfactant groups. Listed in this publication are the HLB values for some 100 Atlas surfactants as well as for 30 surfactants of other manufacturers. This paper, a reprint of a talk by W. C. Griffin of the Atlas Central Research Laboratories at a recent meeting of the Society of Cosmetic Chemists, is entitled "Calculation of HLB values of Non-ionic Surfactants." A copy is yours for the asking.

chem-memos

SORBO®—sorbitol solution... now shipped in distinctive drums



The 55-gallon drums in which Sorbo (70% sorbitol solution) is shipped have recently been redesigned. The result, as shown in the photograph, is a strikingly attractive green and snow-white container, easily identifiable in storage and complementing the appearance of the plants where it is used.

The product is unchanged. It is the same high-purity, constant-quality sorbitol that scores of cosmetic and pharmaceutical manufacturers have used for years for moisture conditioning, softening, and bodying action in an ever-growing variety of products.

Sorbo is available in mass production quantities. Its low price means big savings to you. Write to us for technical data and cost information—or for samples and technical assistance in experimental work.

Non-crystallizing polyol solution

A humectant-softener which possesses many properties valuable in cosmetic formulations is now available from Atlas. Designated Atlas G-2401, the product is an 85% aqueous solution of technical hydroxypropyl sorbitol.

A light straw colored liquid, it has a viscosity of approximately 3500 cp at 25°C. It is non-volatile . . . and thus affords permanent conditioning action. Because it is a mixture of water with a material that is liquid at normal operating temperatures, it does not crystallize upon loss of water or under usual storage conditions. It has a narrow humectant range and low equilibrium moisture content . . . qualities which indicate its applicability for use as a moisture stabilizing agent. It is recommended only for external preparations at the present time, although preliminary studies indicate its oral toxicity to be of a low order.

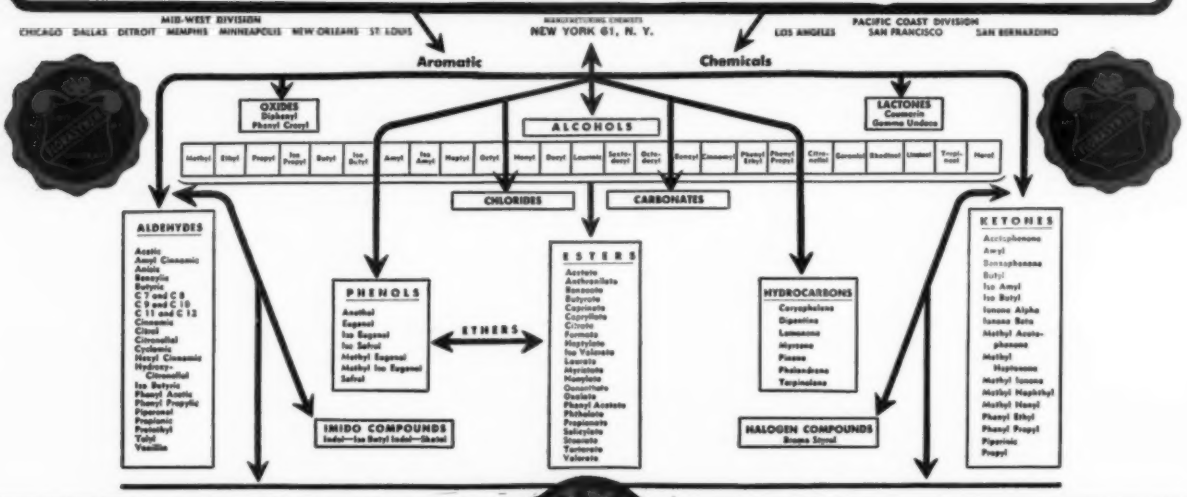
We'll be glad to send samples and technical data.

New Atlas plant opened in Canada

As the latest step in Atlas' program of expansion of its chemical manufacturing facilities, a new emulsifier plant started production on October 7th. The plant is operated by Atlas Powder Company, Canada, Ltd.

The completion of these new facilities offers a convenient source of emulsifiers to Canadian manufacturers. The plant incorporates the latest in quality control techniques, and is the largest emulsifier esterification plant in Canada.

FLORASYNTH LABORATORIES, INC.



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Notes from the makers of **Myvax Vitamin A**

What's the matter with vitamin A acid?

For food and pharmaceutical preparations, we offer Myvax Vitamin A Acetate or Palmitate. We know exactly what it is and a great deal about what it does and why. So do our customers.

For a puzzle, we recommend vitamin A acid. Very little is known about its biochemistry. This much we know: Vitamin A acid appears to have about the same potency as vitamin A when bioassayed by the rat growth method. The rat grows all right, but you can't find the vitamin A in him. No matter how much you give him, he doesn't deposit any perceptible amounts either as the acid or as vitamin A in his tissues or organs. This makes vitamin A acid unique, since other vitamin-A-active compounds, including carotenoids, are deposited in substantial quantities as vitamin A in the various tissues.

It doesn't look as if vitamin A acid will ever become important to the food or pharmaceutical businesses. But who knows? Someday a customer may call up and want to know something about it. We want to be able to supply helpful information as well as Myvax Vitamin A and Myvapack Vitamin A. Both the information and the vitamins are available from stock. ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • Charles Albert Smith Limited, Montreal and Toronto • W. M. Gillies and Company, Los Angeles and San Francisco.

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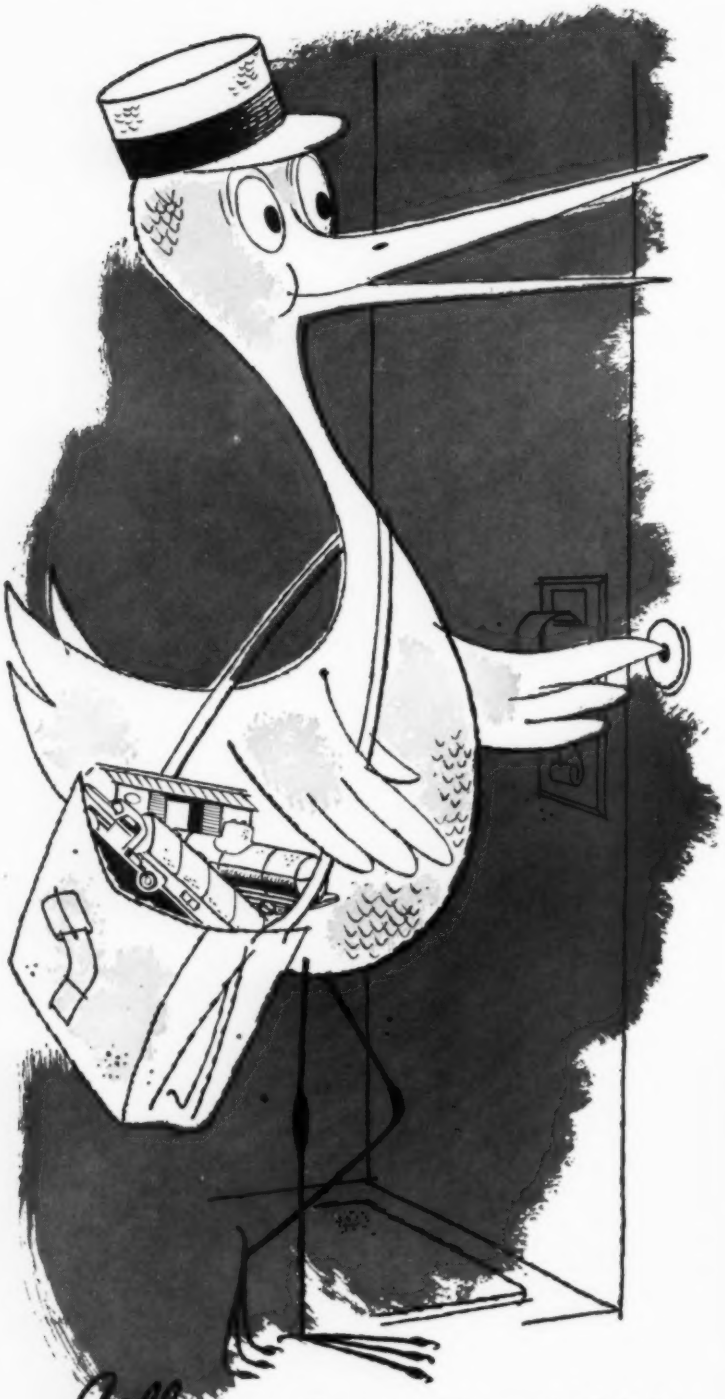

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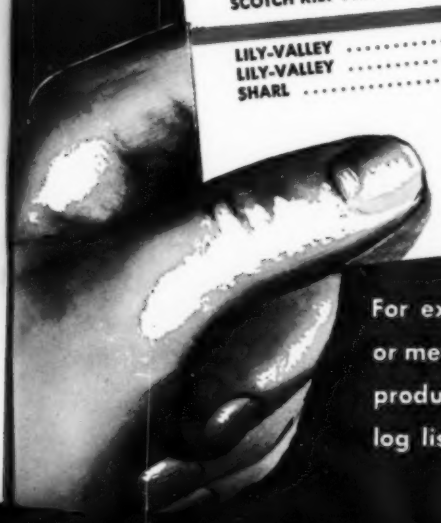
MODERN 65	2-376	CS	$2.10	✓✓✓	✓✓✓				✓✓	✓✓✓	
ALAMASK® CA	2-193	CEDAR	2.20						✓✓		
BOUQUET LM	7331	LAV-MINT	2.50								
MINT	7351	MINT	2.75								
ALAMASK ND	1-773	SPICE	2.75								
BOUQUET PI	7321	PINE	3.15	✓			✓✓			✓	
BOUQUET	7340	FLORAL	3.50	✓					✓		
LEMON	7212	LEMON	3.60								
PINE	7338	PINE	3.75								
MINT	7313	MINT	4.00								
BOUQUET OZ	7327	OZONE	4.25	✓✓✓	✓✓		✓	✓✓	✓		✓
COLOGNE	7329	COLOGNE	4.50	✓✓✓	✓✓						
BOUQUET BG	7200	COLOGNE	4.75		✓						
ORANGE BLOSSOM	7344	ORANGE BLOS.	5.00								
SWEET PEA	7201	SWEET PEA	5.00								
COLOGNE	7337	COLOGNE	5.00			✓	✓✓		✓		
PINE NEEDLE	7342	PINE	5.15			✓✓	✓✓				
MODERN 32	2-243	MODERN	5.25			✓✓	✓		✓		✓
FOUGERE	7281	FOUGERE	5.15								
LAVENDER H	7333	LAVENDER	5.25	✓							
BOUQUET SP	2-500	SPICE	5.25	✓✓	✓✓	✓✓					
BOUQUET C	7290	CHYPRE	5.25								
BOUQUET	7282	LAV. FOUGERE	5.50	✓		✓	✓				
FLORAL	7330	FLORAL	5.75								
BOUQUET ST 65	2-477	FLORAL	5.75								
ROSE	7346	ROSE	5.85			✓		✓			
FOUGERE	7320	FOUGERE	5.85				✓✓				
LOCUST BLOSSOM	7339	LOCUST BLOS.	6.85				✓				
GARDENIA	7306	GARDENIA	6.85								
BOUVARDIA	7341	BOUVARDIA	7.60								
COLOGNE	7348	COLOGNE	7.85			✓		✓	✓		
LILAC	7240	LILAC	8.35				✓				
LAVENDER	7283	LAVENDER	9.00			✓			✓		
COLONIAL	7347	SPICE	9.90								
SCOTCH KILT	7349	HEATHER	12.50								
LILY-VALLEY	7350	LILY-VALLEY	13.75			✓			✓		
LILY-VALLEY	R-133	LILY-VALLEY	18.90			✓					
SHARL	6279	ORIENTAL	20.00								



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Write for your copy of this chart

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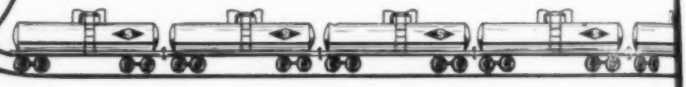

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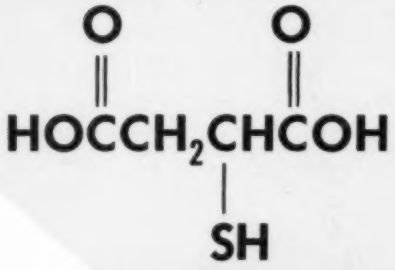

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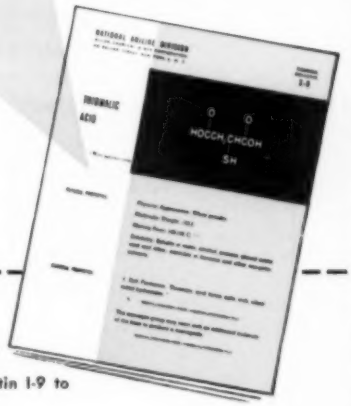

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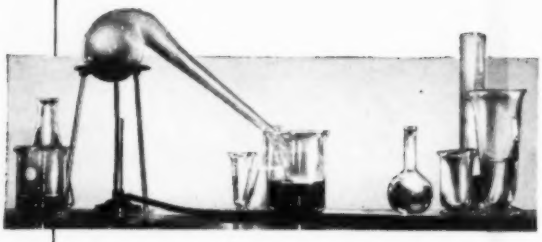

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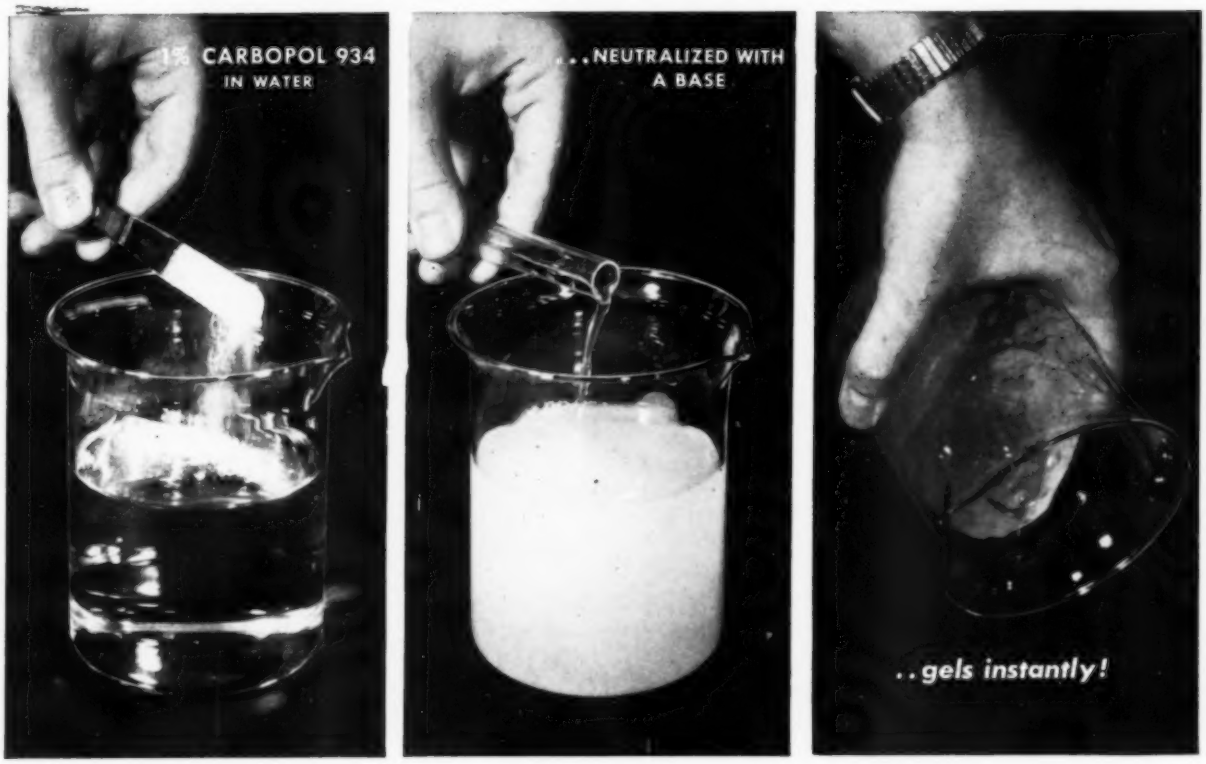

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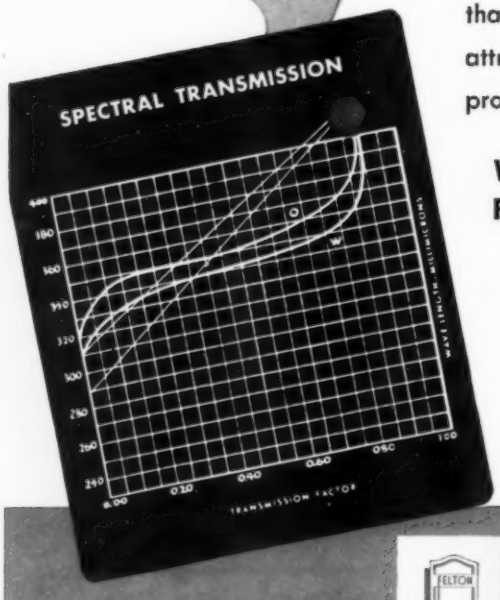

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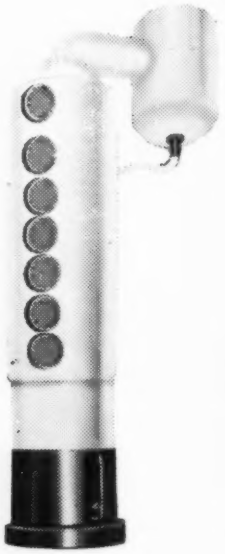

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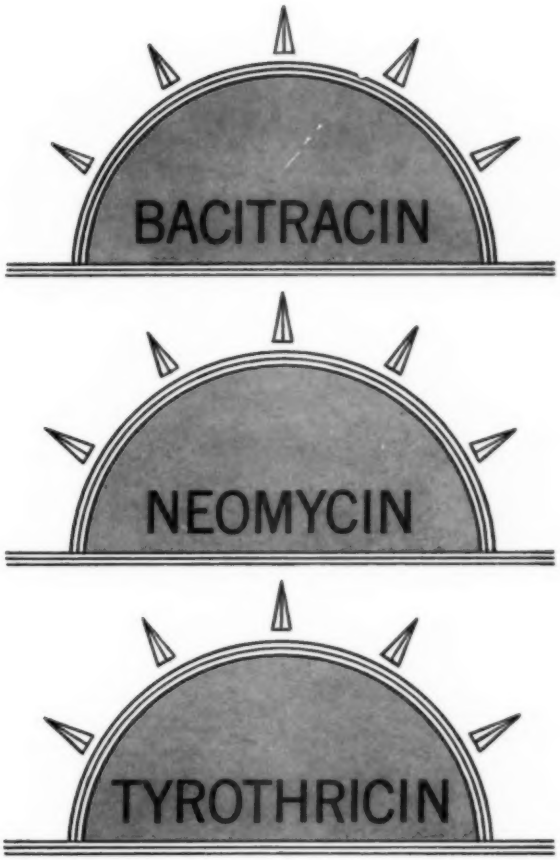

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1. Pillsbury and Kligman, Correspondence, British Medical Journal, March 20, 1954. Page 706.
2. J. M. Greenhouse and W. C. Ryle, A.M.A. Archives of Dermatology and Syphilology. 69:366-67, March, 1954.

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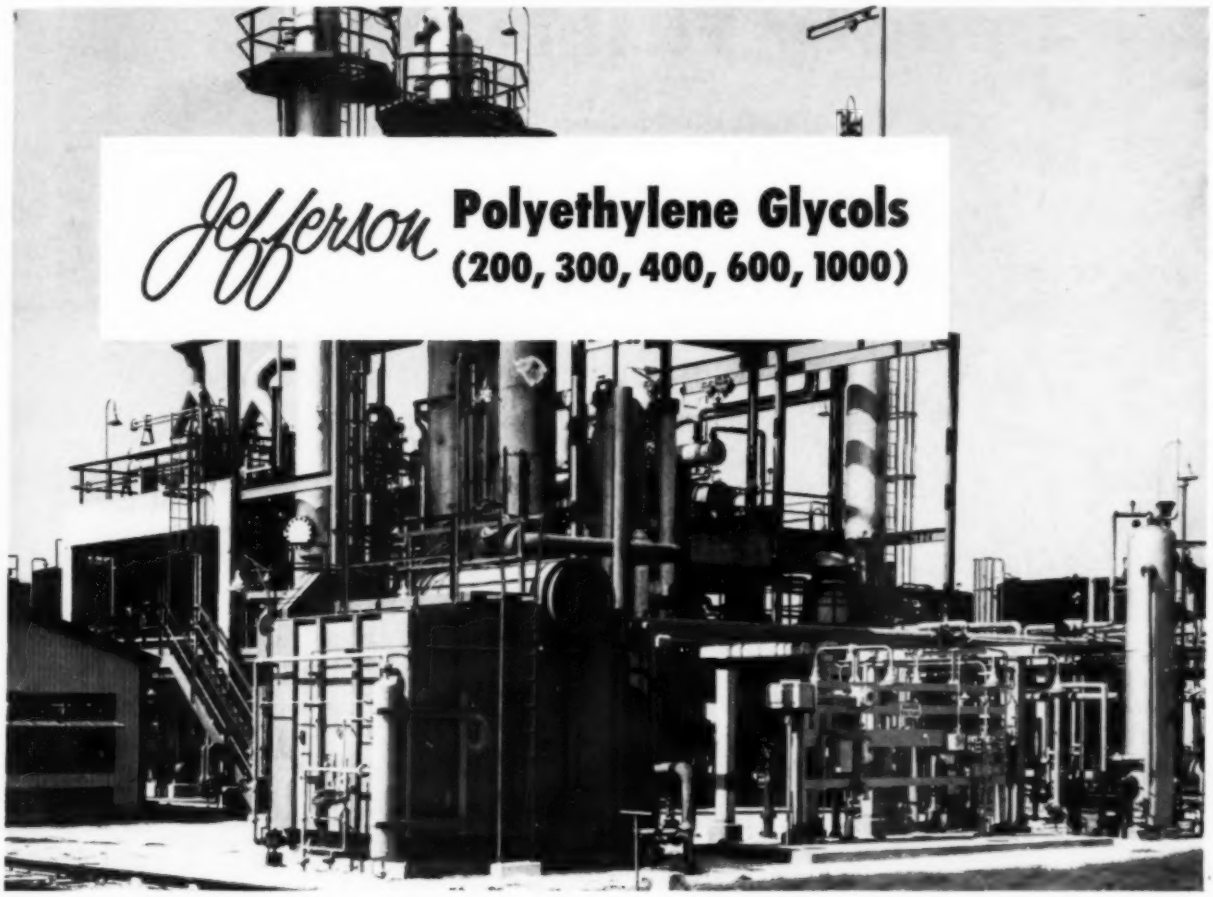

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Keeping Posted

New Antibiotics

Any idea that antibiotics have run their course was dispelled by the long list of new antibiotics which various manufacturers are grooming for possible introduction in the market. Among these are Sharp & Dohme's fungichromin, fungichromatin, and pleomycin; Rhone-Poulenc Research Laboratories' (Paris) spiramycine; Bristol Laboratories' etamycin; Parke, Davis & Company's griseoviridin and viridogrisein; Chas. Pfizer's anisomycin and PA-105; Lederle's Puromycin; and Upjohn's celesticetin.

Pfizer's anisomycin, which has already been tried on humans and looks as if it might reach the market, is aimed at certain persistent parasitic infections which so far have defied successful treatment. Pfizer's PA-105, isolated from culture filtrates of a strain of Streptomyces antibioticus, has shown promise against Gram-positive bacteria in animals.

Upjohn's celesticetin also attacks Gram-positive bacteria as indicated by in-vitro activity against micrococci, streptococci, pneumococci, and clostridia. It has very limited antifungal activity.

Sharp & Dohme's fungichromin is an unmistakable antifungal agent. Sharp & Dohme's pleomycin is active against both Gram-positive and Gram-negative bacteria, but tissue irritation from local application appears to doom its therapeutic use.

Rhone-Poulenc Research Laboratories' spiramycine gives much promise for infections caused by Gram-positive bacteria resistant to other antibiotics.

Bristol Laboratories' etamycin inhibits tuberculosis germs in vitro. In-vivo tests on mice also disclosed activity against D. pneumoniae, with low toxicity.

Parke, Davis' broad-spectrum antibiotic griseoviridin is particularly effective in vitro against strains of clostridium, corynebacterium, diplococcus, escherichia, hemophilus, neisseria, shigella, and streptococcus. It has proved effective against pertussis infection in mice, and clinical bovine colimastitis. Parke, Davis' other broad spectrum antibiotic viridogrisein is well tolerated locally by cows, and orally by mice and dogs. It cures bovine staphylococcal and streptococcal mastitis, and intestinal amebiasis in rats and dogs. Data on its value in human treatment is not yet available.

Cosmetic Tax and Schools

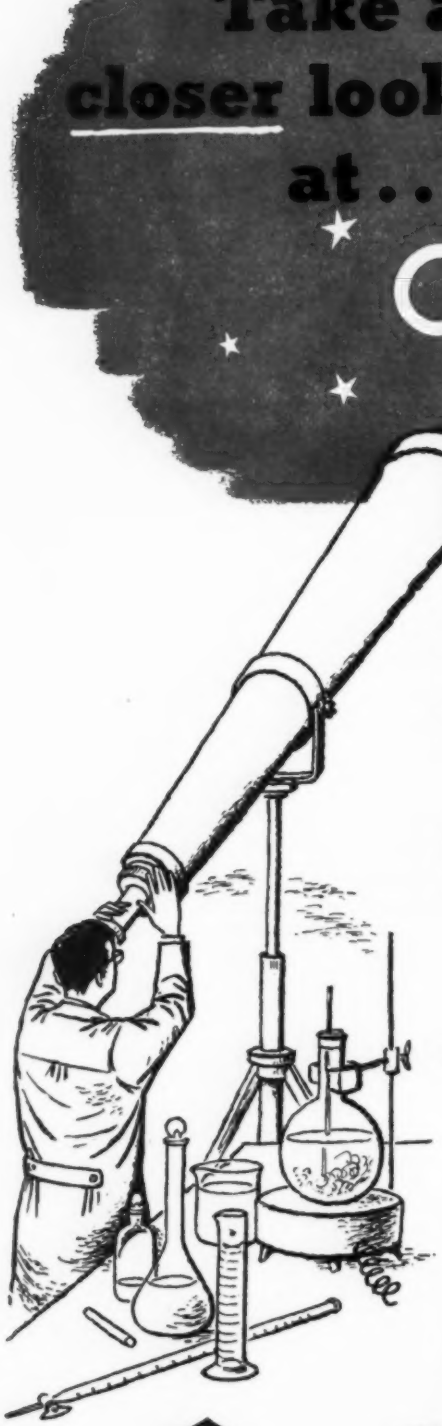
Clarification of the exemption from Federal excise tax granted cosmetics which are used in barber shops and beauty parlors is contained in the following Internal Revenue Bulletin:

"The exemption from retailers' excise tax provided by section 2402 (b) of the Internal Revenue Code of 1939 with respect to the sale of toilet preparations to any person operating a barber shop, beauty parlor, or similar establishment for use in the operation thereof, is applicable to toilet preparations sold to any person operating a school for instruction of students in beauty culture. This exemption does not apply to the sale of such preparations to students of a beauty school for use by them in practice work or on patrons of the school or for any other purpose, for the reason that such students do not qualify as persons operating barber shops, beauty parlors, or similar establishments. Likewise, the exemption is not applicable to the sale of toilet preparations to a motion picture studio for use on the studio stars."

Richest Source of Vitamin C

A fruit known as the Puerto Rican cherry, West Indian cherry, or the acerola, is said to be the richest source of vitamin C. A six-ounce glass contains as much as 8,650 milligrams of vitamin C—more than 85 times as much as a six-ounce glass of orange juice, according to Mrs. Anna May Wilson in November Today's Health Magazine, published by the American Medical Association. Described as a neglected backyard tree, the fruit's amazing vitamin value was first discovered in 1945 by Dr. Conrad F. Ansenjo. Now, after ten years of efforts to interest "the giants of the food industry" in its potentialities, the first commercial crop finally has been produced and is ready for the market. Mrs. Wilson says that it would take over 50 pounds of fresh raw cabbage to give the same amount of vitamin C as a glass of acerola juice.

Take a closer look at... HEYDEN BENZYL CHLORIDES



The high quality and uniformity of Heyden Benzyl Chloride have established it as a dependable raw material in the production of essential oils, pharmaceuticals, dyes, resins, plasticizers and quaternary ammonium compounds. Research chemists find this low cost, reactive intermediate useful in the synthesis of new products for many and varied applications.

Heyden's extensive work in the chlorination of toluene has also produced a number of chlorobenzyl chlorides. These compounds have many interesting applications in organic syntheses, and deserve a close look by your research department.

Benzyl Chloride **Ortho-Chlorobenzyl Chloride**
Para-Chlorobenzyl Chloride
2,4-Dichlorobenzyl Chloride **3,4-Dichlorobenzyl Chloride**

Pentachlorobenzyl Chloride
(Available in research quantities)

OTHER HEYDEN CHLORINATED COMPOUNDS

Chlorotoluenes Chlorobenzaldehydes
Chlorobenzoic acids
Chlorobenzotrichlorides Chlorobenzoyl chlorides

FINE HEYDEN CHEMICALS

HEYDEN CHEMICAL CORPORATION
342 Madison Avenue, New York 17, N.Y.
CHICAGO • CINCINNATI • DETROIT • PHILADELPHIA • PROVIDENCE • SAN FRANCISCO

Mrs. Wilson's husband, Dr. James R. Wilson, director of the A.M.A. Council on Foods and Nutrition, was the man who interested orange juice millionaire Harvey Greenspan, Miami, in the acerola. The first use of C-rola juice will be in infant food, according to Mrs. Wilson, who says:

"Desirable variety will be added to many a baby's diet by the addition of this natural protective food to such things as apple juice or pear juice. Next perhaps will be the enrichment of soft drinks not with chemicals but with a pure nutritious fruit juice in quantities so small that no flavor change will be noticed. The possibilities seem endless."

Learning of the fruit's possibilities in 1949, Mr. Greenspan backed the planting of the first orchard, which produced its first harvest this Spring after an expenditure of a quarter of a million dollars on the project. The tree grows wild in the Caribbean islands where natives say that a tree in the back yard will "keep colds out of the front door."

Health Insurance and the FTC

Two of the health and accident insurance companies charged with false advertising answered the Federal Trade Commission charges by challenging the Commission's jurisdiction and by defending their advertising as both honest and free of deception. The two companies are Travelers Health Association, Omaha, Nebraska, and the American Hospital and Life Insurance Company, San Antonio, Texas, which were the first companies to file answers. Eleven of the 17 companies against whom complaints were filed, were granted two-week extensions to file their answers.

Mail has been coming into the Commission by the "bushel basket" as the result of these complaints. Commission spokesmen say that there has been nothing comparable to this flood of mail in the history of the FTC. The letters have come from all areas of the country and all segments of the economy, including all levels of the medical field, they say. Comparatively few letters come from disgruntled policy-holders, most of the writers coming right to the point of criticism of advertising claims, say the Commission officials.

An insurance company spokesman states that competitive damage to the insurance companies involved has resulted from the complaints, and some policyholders are withholding premiums.

FTC Urges Advertising Self-Control

FTC Chairman Edward F. Howry recently urged advertising interests to establish self control and self regulation in their field. He told the Association of National Advertisers that both trade practice rules and stipulations are devoted largely to maintaining truth in advertising. He further said that the Commission would handle advertising cases without the delay that has characterized such handling in the past.

"I was amazed to learn," he said, "that the average advertising case passed through 87 different administrative steps and underwent more than 20 separate reviews. This is no longer the case. We have eliminated most of these steps. The new organization (of the FTC) represents a major change in both concept and structure. It is much simpler than the old organization. With well selected personnel in top spots, the Commission is now developing a high level of efficiency."

Charles E. Grandey, director of the FTC's Bureau of Consultation, told AMA details of the voluntary consultation program which Commission has developed. The first use of this consultation procedure occurred last September when the Commission suggested advertising standards to the cigarette companies for their comment and suggestion. After adequate time for study, an industry conference was held the middle of last month. "I hope that final standards will soon be in effect in that industry," said Mr. Grandey.

Dr. Dutchess Becomes Consultant

Dr. Charles E. Dutchess resigned as medical director of Schenley Laboratories to become a consultant in the pharmaceutical field, with Schenley as his first client. Widely known in the field of geratric medicine, Dr. Dutchess has been engaged in pharmaceutical work for the past 22 years. After practicing private medicine in Detroit, starting in 1921, he joined the professional service and advertising department of Parke, Davis in 1932 and remained until 1944 when he began his association with Schenley. He has been vice-president and medical director of Schenley, and for the past ten years he has supervised clinical investigations and professional relations.

The Common Cold

"It is time for industry to put the spotlight, and whatever else is required, on its number-one problem," said Dr. M. W. Newquist, medical director of the Texas Company last month in New York. And industry's number-one problem is not strikes, inflation, or any of many other things; it is the common cold. Dr. Newquist was addressing fifty industrial leaders and bankers who are the mainstay of the Common Cold Foundation, newly formed to marshall the resources of science in a determined, systematic attack on the common cold. Lack of ability to control the common cold is looked on as one of the major disgraces of medicine for which the pharmaceutical manufacturers should shoulder a large part of the blame. Medicine today is practically helpless in controlling this disease, giving advice for its treatment or cure which is no better than that given to our great-grandmothers. All that is known today that was not known when this country was founded is the fact that colds are caused by a virus.

According to Dr. Yale Kneeland, chairman of the Scientific Advisory Committee, the scientists supported by the Foundation will seek to learn all they can about the virus or viruses which cause colds.

As a beginning the scientific committee has been surveying what has been done about the common cold in various research institutions. It then plans to support the promising work in progress. Outstanding work is taking place at Johns Hopkins, the University of Virginia, Harvard, and the University of Illinois. To aid only these four institutions for a sufficiently long

New triple pressed stearic acid from Armour

NEO-FAT® 18-55 STABILITY GIVES YOUR PRODUCTS EXTRA LIFE!

They'll look fresher!

Neo-Fat 18-55 in your finished product means long product life with *no color change!* Unlike ordinary stearic acids, Neo-Fat 18-55 will not turn yellow—even under extended time in storage, high temperature processing and long product life! It was produced by Armour's patented low temperature solvent crystallization process which guarantees a material with color stability *built in!* Chemical ester and concentrated acid tests, as well as severe field tests, have proved that Neo-Fat 18-55 keeps products from changing color—keeps them looking fresher!

They'll smell fresher!

Neo-Fat 18-55 will resist odor-causing rancidity longer than the stearic acid you are now using! The best proof of that is the Tennessee Eastman test—acids are heated for 2 hours at 200° C. and the lightest final color indicates the greatest resistance to rancidity. Of seven competitive acids tested, Neo-Fat 18-55 was found to have by far the lightest color—Lovibond 5¼", 1.1R—5Y!

They'll stay fresher!

Neo-Fat 18-55 resists oxidation and breakdown longer than ordinary stearic acids! Its peroxide index—measuring the amount of oxygen that has combined or reacted with the fatty acid—is only 0.1!

Send today for samples of Neo-Fat 18-55—the finest triple pressed stearic acid you can buy. Send for samples of Armour's economical double and single pressed stearics, too. Test them all against the raw materials you're now using. You'll choose Armour Neo-Fats to make your products look fresher, smell fresher, stay fresher!

MAIL THIS COUPON TODAY

ARMOUR CHEMICAL DIVISION
1355 West 31st Street, Chicago 9, Illinois

Please send me samples of:

☐ Neo-Fat 18-55 (Triple pressed) ☐ Neo-Fat 18-54 (Double pressed)
☐ Neo-Fat 18-53 (Single pressed)

Name _____ Title _____

Firm _____

Address _____

City _____ Zone _____ State _____

D12

ARMOUR CHEMICAL DIVISION
©ARMOUR AND COMPANY
1355 WEST 31ST STREET, CHICAGO 9, ILLINOIS

period, approximately $425,000 will be required. Worthy projects are under way in other medical schools, and these also will be supported.

The backers of this foundation estimate that the common cold costs industry at least $2 billion a year, and possibly as much as $5 billion.

More Antibiotic Knowledge Sought

That more exact knowledge of antibiotics is earnestly desired was apparent throughout the second annual Symposium on Antibiotics held in Washington last month. As a result of this, two general research trends are being followed—possibilities in specificality and in synergism. To determine specificality, antibiotics and their analogs are being studied in relation to their specific activity on single types of diseases.

Syngerism is being studied in the hope that one administration of two or more low-level dosages of antibiotics may be effective in preventing or avoiding development of bacteria-resistant strains. There is also hope of avoiding or eliminating antibiotic sensitivity in the patient. Emphasis here is on fast knockout of the disease, thus avoiding prolonged treatment in which bacteria can develop resistance and during which sensitivity builds up in the patient.

Three general lines of approach are being followed to create synergistic effects with antibiotics. One is to use two or more antibiotics in combination such as tetracycline with Neomycin. Another is to use an antibiotic with one or more of the modern drugs such as the sulfas—tetracycline with polymixin B sulfate, for example. The third approach is to integrate the antibiotics with hormones. According to Henry Welch, director, Division of Antibiotics, Food and Drug Administration, this method is one of the most recent and far-reaching developments in the field. It is now acknowledged that cortisone or hydrocortisone can be used with antibiotics. Previously it was doubted that the two could be administered together to achieve a satisfactory clinical result.

Cement Tablet Coating

Cement coatings are the latest thing for tablets that should be chewed rather than swallowed. Hardness tests show that 24 to 33 pounds of pressure is required to crush the cement coating described in a patent assigned to Winthrop-Stearns by Dr. Richard H. Carroll and Daniel J. Spadaro who developed the new coating. Purpose of the coating is to prevent chewing tablets of some medicines that might injure the lining of the mouth, such as internal antiseptic agents and digestive enzymes. It is also intended to protect the mouth from dyes used for diagnostic purposes, which may stain the mouth or teeth, and from some medicines with an unpleasant taste.

Once swallowed, the cement coating resists action of the stomach juices for approximately 12 minutes, and that of intestinal fluid for about 17 minutes, according to tests with artificial juices. The entire tablet disintegrates in the stomach juices in 50 to 60 minutes, and in the intestinal fluid in 70 to 80 minutes.

Nil-O-Nal Hair Claim Stopped

Nil-O-Nal Company, Chicago, has agreed with the Federal Trade Commission to stop advertising that Nil-O-Nal grows hair. Some claims to be stopped are that the preparation prevents loss of hair or baldness, ends dandruff or scalp scales, improves the health of the hair or has beneficial effects on its follicles. Also to be discontinued are claims that Nil-O-Nal corrects damage done to the hair by improper dyeing, permanents, or bleaches; that lanolin is its main ingredient and that it contains the maximum amount for human use; that it is greaseless, a concentrated lanolin preparation or the closest to pure lanolin of any product available. Also, the company will stop claiming that the vitamin D in its product is beneficial.

Correction

With regard to the article concerning Gevisol, the new Lehn & Fink viricide, we wish to correct a statement in that article attributed to Dr. Morton Klein, Associate Professor of Bacteriology at Temple University. With regard to polio viruses in sanitary work, we stated, "He (Dr. Klein) said that Lysol will not destroy them, but Chlorox will."

Dr. Klein points out that this statement was a major error of fact and of considerable embarrassment to him scientifically. He says:

"The fact that chlorine compounds are markedly inhibited by organic matter is a matter of general scientific information. If a person working in a hospital takes my statement as printed and uses the recommended disinfected dilutions of Chlorox to kill the viruses of poliomyelitis in, say, the feces from a poliomyelitis patient, he will fail. The chlorine compound, or Chlorox, will not kill under these conditions and the viruses of polio will remain viable."

Warner-Hudnut Sells N. Y. Property

Warner-Hudnut, Inc., has disposed of its holdings of New York City real estate to Webb & Knapp, Inc., a large realty firm. The five loft buildings on West 18th Street and West 19th Street which house Warner-Hudnut operations in New York have been purchased by Webb & Knapp and leased back to Warner-Hudnut. Also the two buildings at 693 and 695 Fifth Avenue which have housed the Richard Hudnut Fifth Avenue Salon and the offices of Parfums Ciro, a Warner-Hudnut affiliate, have been sold to Webb & Knapp. These Fifth Avenue buildings are both on plots of 25 by 100, and together have an assessed value of $930,000, of which $775,000 represents land value. The total assessed value of all properties involved in the transaction exceeds $3,200,000.

Goldsmith et al. Buy Hadacol

Harry B. Goldsmith announces that he and certain associates have purchased the Hadacol business which he has been directing for the past several years. The purchase consists of the worldwide trademark, Hadacol, all inventories of raw materials, supplies, finished goods,

DOW PROPYLENE GLYCOL, U.S.P.

the dependable solvent for cosmetics

For formulating improved drug and cosmetic products, you can rely on the quality of DOW Propylene Glycol, U.S.P.

The usefulness of Dow propylene glycol, U.S.P., knows no season . . . it works the year 'round improving drug and cosmetic products of every type. Solvent, preservative, humectant, emollient—Dow propylene glycol is all of these and, best of all, its high efficiency often makes possible the replacement of more expensive ingredients.

Summer brings big demands for suntan preparations with a soothing effect and minimum separation of sun-screen ingredients—your product has both with propylene glycol. Cold weather and winter winds jump the sales of lotions that soothe and soften the skin without residual stickiness . . . again a direct result of propylene glycol's emollient action.

It's the coupling action of propylene glycol that shave cream makers rely on to help their products maintain smooth consistency and creaminess the year 'round. Propylene glycol is also used as a foam stabilizer and mutual solvent in liquid shampoos.

Get the facts in your lab with a sample of quality controlled Dow propylene glycol, U.S.P. For your free sample and information on properties write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. OC 829G-2.

you can depend on DOW CHEMICALS

DOW

and equipment and other property that had previously been owned by the LeBlanc Corporation. Products of the company are Hadacol—a liquid vitamin and mineral tonic—and Hadacol capsules. Mr. Goldsmith, who was president of Grove Laboratories some years ago, is president of a new corporation, Hadacol, Inc., which has been formed under the laws of the State of Delaware. The new owners say that manufacturing operations will continue, at least temporarily, in Lafayette, La., and that an extensive advertising and sales expansion program for Hadacol is being planned.

Fluorohydrocortisone Acetate

Fluorohydrocortisone acetate, said to be 10 times as potent as hydrocortisone on a weight-for-weight basis, was announced last month by both the Sharp & Dohme Division of Merck & Co., and the E. R. Squibb Division of Olin-Mathieson Corporation. Squibb says "the new drug was developed in the laboratories of the Squibb Institute for Medical Research." Having a chemical designation of 9,alpha-fluorohydrocortisone acetate, the drug is being marketed in lotion and ointment forms by Squibb under the trademark, Florinef, and in ointment form by Sharp & Dohme under the trademark, Alfloronex, for skin conditions such as dermatitis (atopic, eczematoid, contact), neurodermatitis, lichen simplex chronicus, eczema, and anogenital pruritus. The greater anti-inflammatory activity of the new drug as compared with hydrocortisone will significantly lower the quantity needed and thus long-term treatment of chronic skin conditions will be more practical and economical.

Delaney Bills to Reappear

Remember the Delaney Committee? This was the Select Committee to Investigate the Use of Chemicals in Food Products which was created in the Democratic House of Representatives prior to the election of President Eisenhower. It will be recalled that this committee was, at a later date, authorized also to investigate the use of chemicals in cosmetics. The chairman of the committee was Representative James J. Delaney, of Queens, New York City.

Since the House of Representatives will again be organized by the Democrats, come January 3, Mr. Delaney will probably again be the recognized sponsor of bills to carry out the proposals of the committee. During the recent session of the House, which was organized by the Republicans, the recognized sponsor of bills of this sort was Representative A. L. Miller, a Republican of Nebraska, who had been a member of the Delaney Committee. Mr. Miller was the author of the Pesticide Residue Act which was enacted into law during the past Summer.

Mr. Miller will reintroduce into the next session of Congress his Chemical Additives in Food Bill (H.R.4901) which he sponsored in the last session. However, two bills which Mr. Delaney introduced last year—H.R. 2244 regulating chemicals in cosmetics, and H.R. 2245 regulating chemicals in foods—will be reintroduced in January "with some refinements."

Mr. Delaney says that a statutory requirement establishing the safety of chemicals used in foods and cosmetics before such products can be marketed "would afford the public the same protection in regard to food and cosmetic products that it now enjoys in the case of drug preparations." He explained this statement by adding:

"While a new drug must be proved to be safe before it can be introduced into interstate commerce, chemicals used in foods and cosmetics are not subject to the same procedure. Dangerous food and cosmetic products may be removed from the market only after evidence establishes to the satisfaction of a court and jury that such products may cause injury to users. Thus the public is subject to risk of injury before corrective action may be taken."

Due to the recent activity of the Food and Drug Administration with regard to the possible harmful effects of some certified colors and of ingredients—spotlighted by coumarin—this sort of legislation might exhibit considerable force of action in a Democratic House of Representatives.

Sterling Enters Fair Trade Suit

Sterling Drug has filed an "amicus curiae" brief in the Supreme Court of Georgia in the fair trade test case involving Cox-Gardner Furniture Co. and the General Electric Company. Sterling thus becomes the first representative of the drug industry to enter the case which is now up for appeal before the state's highest court. The retail furniture is asking the court to declare unconstitutional the recently enacted Georgia fair trade law. A lower body, the Fulton Superior Court, had previously rejected the plea after ruling in favor of General Electric in its first review of the charges.

Noting that it is "a party at interest but not to the record," Sterling states in its brief that it has availed itself of state and federal fair trade laws "to protect reputable retailers, the consuming public, Sterling's distribution system, and property rights in its good will."

Would Extend Antibiotic Certification

Dr. Henry Welch, director, Division of Antibiotics, Food and Drug Administration, stated last month that "in the interest of public welfare all antibiotic drugs should be subject to the certification requirement if they are of sufficient importance." He also pointed out that antibiotic preparations shipped to foreign countries need not be certified under the present system, provided they meet the requirements of the foreign buyer and are not in violation of the laws of the country to which they are shipped.

Apparently Dr. Welch is not content because all antibiotic preparations are not under the direct control of his department, and because antibiotic preparations shipped to foreign countries are not under his control. He said that an amendment to the Food, Drug, and Cosmetic Act was necessary to bring about these changes.

Of the widely distributed antibiotics, Terramycin (oxytetracycline) is the only one that is not subject to certification. The newest one—tetracycline—has been declared to be subject to certification by the Food and

Drug Administration because it is a derivative of Aureomycin (chlortetracycline).

It will be recalled that some time ago the Food and Drug Administration had several conferences with the pharmaceutical manufacturers in an attempt to arrive at a "general" certification amendment to the Food, Drug, and Cosmetic Act which caused certification to be applicable to all existing antibiotics, and also to be applicable to all new ones when they were discovered. One reason why this amendment was never drafted was that it appeared impossible to write a definition that would not include all drugs, whether or not they were antibiotics by nature. Apparently the FDA has not given up this idea.

As regards goods shipped to foreign countries, the FDA apparently still believes that it should be able to dictate to foreign countries what drugs they should receive, and how they should be packaged and labeled. This was the plan behind the Van Zandt bill which was never enacted by Congress. It seems to be the opinion of the FDA that authorities in foreign countries are incapable of deciding what is desirable in the treatment of disease in their own countries. They need the FDA to tell them.

Fair Trade Again Upheld

For the third time within a year, the U. S. Supreme Court sustained the constitutionality of fair trade by refusing to review appeals from decisions upholding fair trade which had been handed down by the high courts of New York and New Jersey. This action followed two occasions in the Fall of 1953 when the court refused to review appeals in the Schwegmann-Lilly litigation. Involved in the cases recently dismissed was the charge that the fair trade acts violate the due process clause of the U. S. Constitution, the charge that these laws constitute an unlawful delegation, through the McGuire Act, of the power of Congress over interstate commerce, and the charge that the laws represent an unlawful delegation of power over prices to private individuals.

The cases involved were Gray-Robinson Stores v. Lionel Corporation, attacking the constitutionality of the New Jersey fair trade law; S. Klein v. Lionel Corporation, attacking the constitutionality of the New York fair trade law. Both of these were dismissed "for want of a substantial Federal question." Writs of certiorari (hearings by the U. S. Supreme Court) were refused in two cases which challenged the constitutionality of the McGuire Act. These cases were a separate appeal in the case of S. Klein v. Lionel Corporation, and an appeal in the case of Sam Goody v. Raxor Corp., Soria Sales Corp., and capitol Records, Inc. This latter case also involved the issue of whether the McGuire Act covered mail-order sales in interstate commerce.

The Gray-Robinson appeal (Gray-Robinson is the parent company of S. Klein) followed a decision by the New Jersey Supreme Court upholding that state's fair trade law. The other appeals sought to overturn the decision of the New York State Court of Appeals sustaining the constitutionality of the state fair trade law and the McGuire Act.

From these decisions it appears definitely that the McGuire Act is constitutional and that fair trade acts are also constitutional as far as the Federal government is concerned. This latter angle means that the present court still stands by the Old Dearborn decision of 1936 which upheld the fair trade laws of the states at the Federal level.

However, it must be realized that there are no fair trade acts in the States of Missouri, Texas, and Vermont, and in the District of Columbia. It must also be realized that the states of Arkansas, Florida, Michigan, Nebraska, Tennessee, and Utah have practically nullified the fair trade acts. This means that complete control through fair trade is possible only in 39 states.

Pfizer Plants for South America

Plants for production of Terramycin and other Pfizer antibiotics are to be erected in Chile and Argentina, says Pfizer president John E. McKeen, who recently returned from the South American countries of Peru, Chile, Argentina, Ecuador and Colombia. The Chilean and Argentina plants will be joint ventures with pharmaceutical firms of those countries, with key technical personnel of each country being trained in the Pfizer plants in Brooklyn, Groton, and Terre Haute.

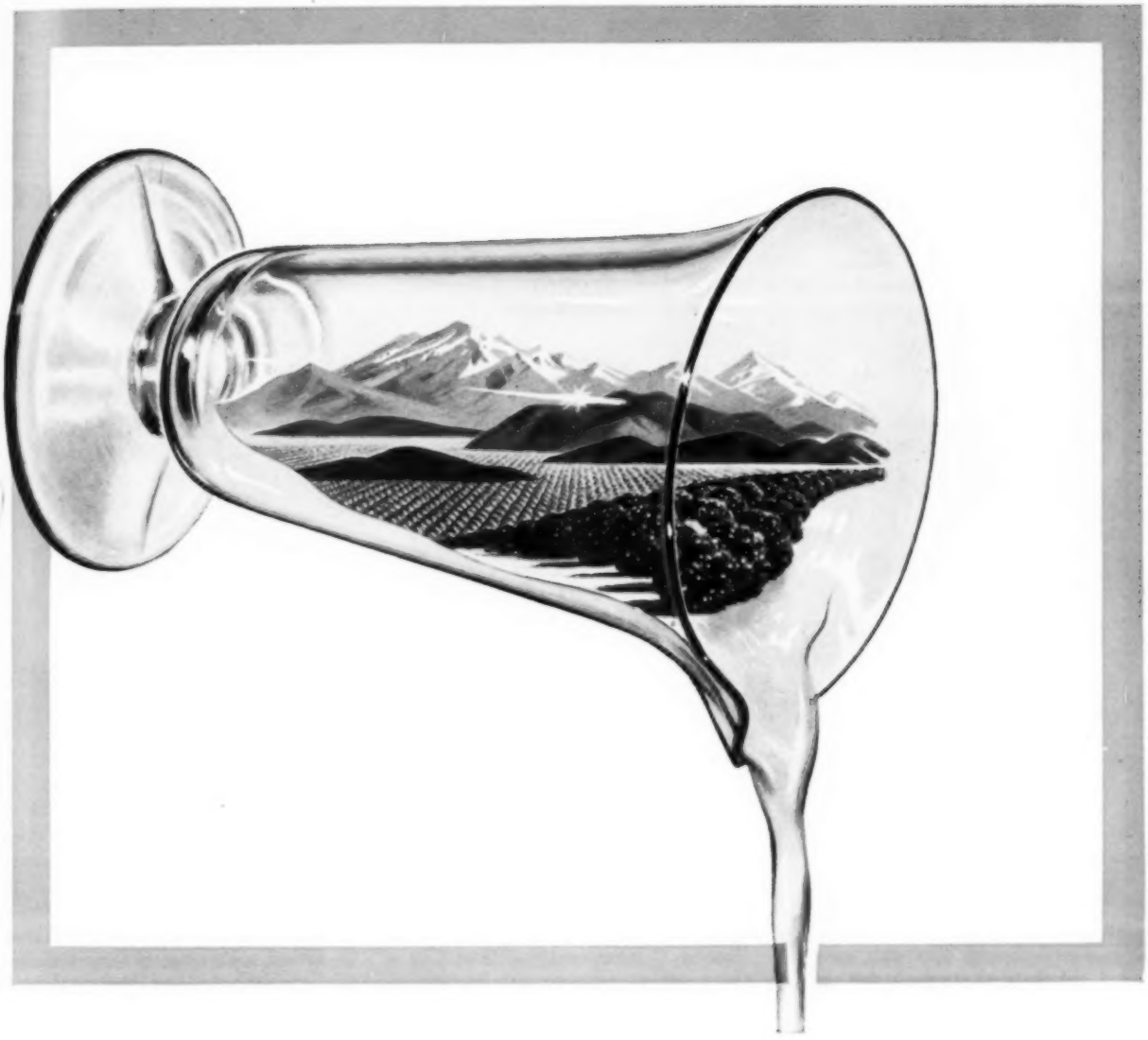
At the time that proposed South American plants were being announced, a new Pfizer plant in England was being dedicated at Sandwich, Kent. Both Terramycin and tetracycline will be produced there.

Shillito's Will Match Discount Prices

Meeting the prices of discount houses is the plan of Shillito's, a Cincinnati affiliate of Federated Department Stores. Shillito's will meet the price of identifiable pieces of merchandise sold elsewhere below the fair trade or suggested list prices. Where there is evidence of price cutting, Shillito's will give notice and a period of ten days to two weeks to change the situation in any competing store. If this is not accomplished, Shillito's will then sell the commodity at the competitive price. Stating that General Electric, Westinghouse, Sunbeam, and Schaeffer Pen had cooperated in bringing prices into line, Fred Lazarus III, executive vice president of Shillito's, said the new policy will begin with toys.

FDA and Motion Sickness Remedies

The Food and Drug Administration has formalized by regulation the change in status of a drug product from restriction to prescription, to over-the-counter sale. Recently manufacturers of some motion sickness remedies of the antihistaminic type have filed amendments to their new drug applications requesting a change to over-the-counter sale. After careful study by the FDA, these requests were granted. Now this type of action is covered by a new regulation promulgated November 13, and established under Section 503(b) (3) of the Federal Food, Drug, and Cosmetic Act (Durham-Humphrey Amendment).



THE LEADING ORANGE OIL WITH CALIFORNIA FLAVOR

There's a reason for the growing popularity of Exchange Oil of Orange. Only Exchange Brand combines the flavor and aroma of California oranges with *Exchange* quality. Carefully selected oranges from the famous California groves of Sunkist Growers are processed to scientific specifications in modern California plants. You receive distinctive flavor and fragrance... in addition to unmatched uniformity of strength.

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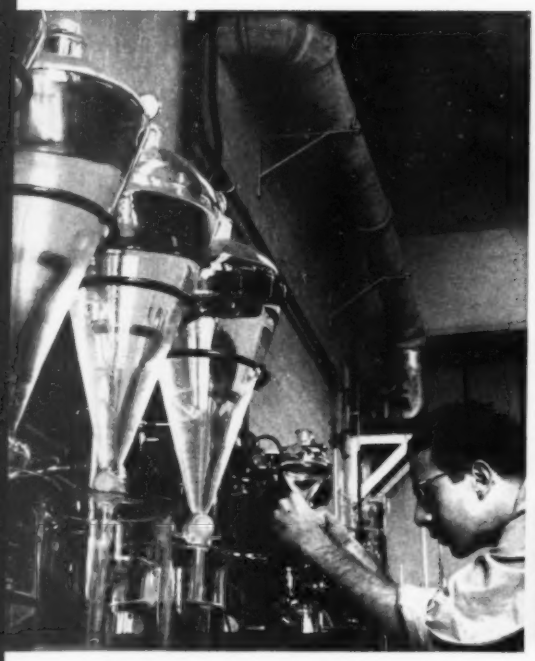
Produced by
The Exchange Orange Products Co.
Ontario, California

Distributed in the U. S. exclusively by
DODGE & OLCOTT, INC.
180 Varick St., New York 14, N. Y.
FRITZSCHE BROTHERS, INC.
76 Ninth Ave., New York 11, N. Y.

Exchange
OIL OF ORANGE U. S. P.

How Givaudan's quality control helps you produce better perfumes and cosmetics



Specially trained chemists, working with most modern equipment obtainable, assure physical and chemical standards that vary little within extremely narrow limits.

Olfactory control, key to success in perfuming, is maintained at Givaudan by a large staff of perfumers with long experience and exceptional ability.

Fashions in perfumes, both here and abroad, are constantly being evaluated by Givaudan's staff and interpreted into new fragrance ideas and themes.

Our serv
advise ar
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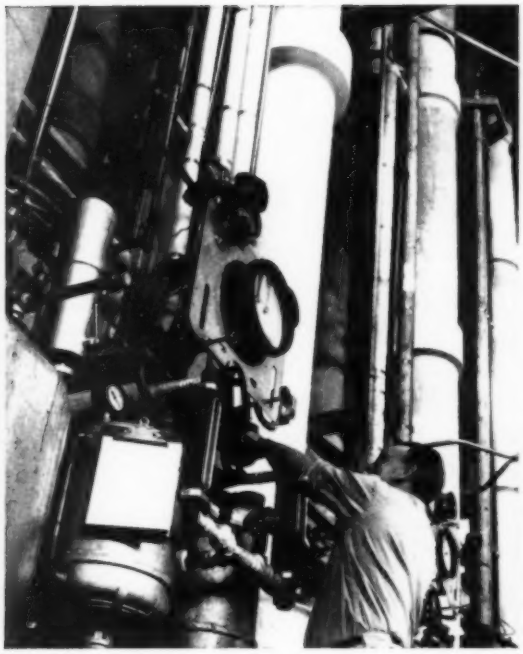
Our service laboratories are prepared to advise and assist you in using Givaudan materials to obtain uniform results in perfumes and cosmetics of every type.



Continuity of supply and consistency of quality are assured by Givaudan's modern, up-to-the-minute facilities for large-scale production and careful control over sources for basic materials.

Uniformity of fragrance in a complete line of cosmetics can be achieved because of Givaudan's skill in evaluating and adapting for compatibility and stability.

As the world's largest producer of aromatic materials, Givaudan has developed rigid control methods that enable you to achieve and maintain finer odor qualities.

Better perfume materials through constant research and creative ability

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330 West 42nd Street • New York 36, N. Y.

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MALLINCKRODT

Bismuth Compounds

IN THE PROPER FORM

MAKE PHARMACEUTICAL MANUFACTURING EASIER

Mallinckrodt supplies a variety of bismuth compounds in controlled physical form to meet pharmaceutical manufacturing requirements. For example, the *controlled bulk* of Mallinckrodt ***Bismuth Subcarbonate*** assures uniform fill where the bismuth salt is the major ingredient in the preparation; *controlled particle size* (a factor in settling) results in a uniform suspension, important to product appearance.

Mallinckrodt bismuth compounds are used in many pharmaceutical preparations as coating agents for mucous membranes, especially in the treatment of gastritis, enteritis and gastric and peptic ulcers. Certain bismuth compounds are used externally in the form of dusting powders, ointments, pastes and suspensions in the topical treatment of wounds, skin eruptions, ulcers and burns.

A few Mallinckrodt bismuth compounds most used by pharmaceutical manufacturers:

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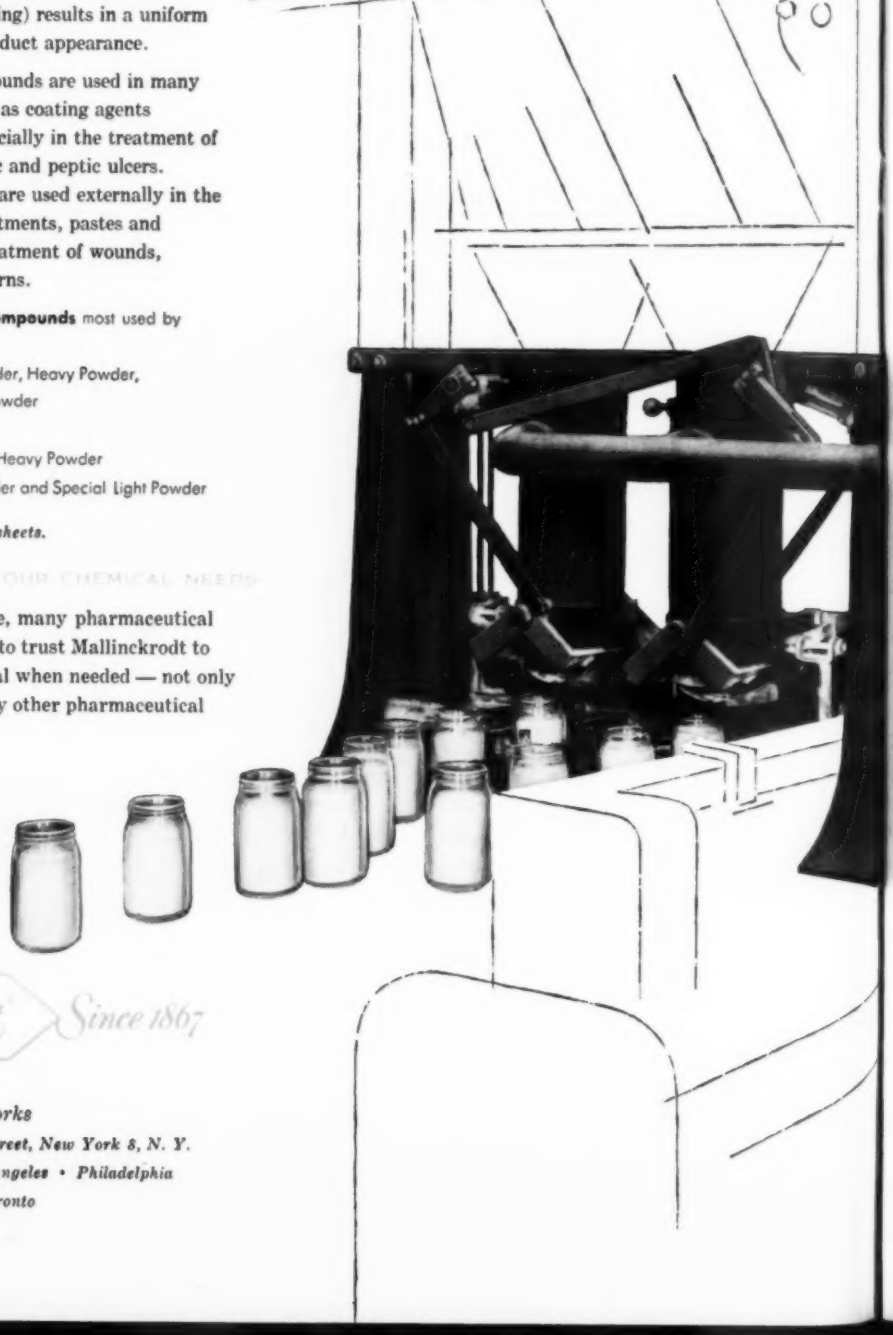

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The Perfume UNDERGROUND

The great perfume swindle is under way again this year. During the last Christmas Season, Americans paid out over five million dollars for a perfume that wouldn't be too good in an insecticide. Because the people perpetrating this fraud seem to have come up with a honey of a get-rich-quick formula, this Christmas Season would undoubtedly defraud the public of a great deal more money except for the fact that the industry has alerted retailers, consumers and every possible enforcement agency. Quite a few incipient imitators have already been nipped in the bud.

This deception to the American public was started last year by an individual who has been in and out of this industry for over 20 years. This individual hit on a formula which undoubtedly produced the biggest sale of perfume (no toilet water or cologne) of any company in the industry. According to testimony of a member of this group taken into Police Court hearing, these people purchased one million perfume bottles, a purchase which would make anyone else in the industry stunned with bulged-eyed surprise.

The formula which made this perfume so fantastically successful was to take a full page advertisement in one of the top leading fashion magazines and in this advertisement set a price of $20.00 an ounce. This advertisement was used to influence a few retailers to purchase the perfume. These people appealed to certain department stores whose purchasing policy concentrates much more on the free sales aids that are given to them than on the value or the quality of the product. In this particular case, department stores were offered cooperative advertising with full price paid, rentals for counter space, P. M.'s and other inducements which made the short-sighted buyer believe that he had made a very shrewd deal for his store. Using the full-page advertisement in a famous fashion magazine and also cooperative newspaper advertisements over the name of a well-known department store and with each of these advertisements prominently featuring a price of $20.00, this perfume outfit flooded the country with house-to-house agents who intensively canvassed a community and particularly specialized in factory and office canvassing. This advertised $20.00 perfume was variously offered at $3 to $4 to $5 a package.

Unfortunately, there is nothing specifically illegal about advertising a perfume for $20.00 and then selling it for $4. At the same time, a lot of practices, if not exactly fraudulent, were open enough to misrepresentative and other unethical business practices to bring down on their heads such organizations as the Better Business Bureau and the Bureau of Ethical Security and to bring up a question as to proper labeling. Nevertheless, this particular way of doing business opened so many opportunities for operators who have no complexes about misrepresentation and some of whom are not the least alarmed at fraud, that this Christmas Season started in with a promise of a veritable epidemic of these practitioners.

One such operator has been covering the South with a degree of speed and concentration that could well be the envy of a legitimate enterprise. To quote from a letter recently written by a leading retailer in a prominent Southern city:

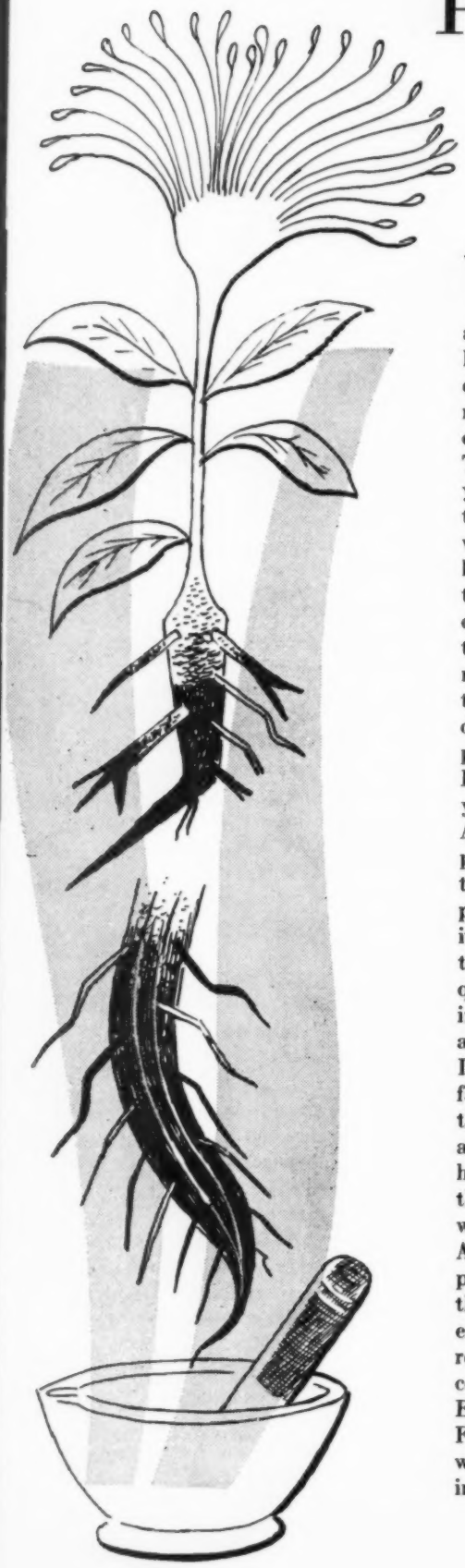
"These salesmen in their sales presentations tell housewives that the perfume is available at our store, naturally, at a much higher price. Warnings have been published in our newspapers, and our city Police Department is awaiting the opportunity to interrogate these solicitors, but somehow they have always left the neighborhood when calls come into our store about the perfume.

"We have never heard of this perfume, let alone carried it in stock."

This particular store did not carry the perfume, and apparently in this case the agents did not even bother to contact the store. However, to quote from a letter written by Dr. W. Langer of Parfums Evyan, here's one way in which the stores were used last year.

(Continued on page 867)

PHARMACEUTICAL



While research activity in the pharmaceutical manufacturing industry continues at a high level, the discovery of products of an entirely new nature seems to be at a comparatively low level. By this we do not mean to imply that there is a dearth of new and very useful products being introduced as the result of this research, but rather do we mean that these new products are largely improvements over products of the same nature which have been on the market for several years.

The great growth of the pharmaceutical manufacturing industry within recent years is based upon the discovery of several new-product types. The first of these—and the one which just about dates the start of the upsurge in the industry—was the sulfa drugs, then came the antibiotics, the antihistamines, and the steroid hormones. And during all this time the great development of the vitamin industry took place. All of these several types of products brought about great segments of growth in the industry. The growth brought about by groups of products was the result of intense research activity by the pharmaceutical industry and the medical schools and hospitals of the country. This research was mainly directed toward discovering and clinically testing new products of the same type as the original discovery, or new chemical derivatives of one or more of the original products.

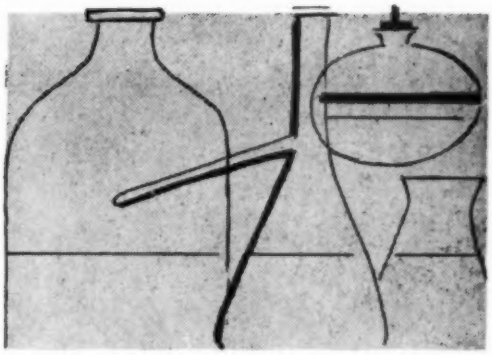
But when a new type of product is discovered, it takes only a comparatively few years before the possibilities of improved products is pretty well exhausted. And by that time the number of products on the market, and the sharp competition between them, makes further expansion of the industry as the result of this group of products just about impossible. By that time the new type of product has been applied to practically every type of disease it will control, and its ability to displace other products is about at an end. Furthermore, by that time, there is generally a new type of product appearing on the market, and quite often this new type tends to displace the former type of product in an increasing number of applications. This is what the antibiotics did to the sulfas, and is what the steroid hormones did in part to the antibiotics.

It often occurs that some time after a type of product appears to be played out, so far as improvement and increased use are concerned, a new product of this same type appears on the market and takes an inordinate share of the available business even displacing, to some extent, products of a later type which have replaced the class of drugs in question. This was the case with Gantrasin—the Hoffmann-La Roche sulfa drug which was introduced long after sulfa drugs were thought to have had their day and when the antibiotics were in full swing.

As entirely new-product types are discovered, the directors of research are more puzzled than ever as to where to look for new products to control diseases that have thus far defied control, or where to look for products which will out-perform existing drugs in the control of certain diseases. Before the comparatively recent upsurge in this industry, by and large the avenues of approach to the control of infection were the biologics and chemotherapy, as demonstrated by Ehrlich with Salvarsan.

For a very long period of years it appeared that the chemotherapy of Ehrlich with synthetic chemicals did not hold the promise that was anticipated. Then, in Germany again, the efficacy of the sulfa drugs was revealed to bring about

RESEARCH



a new wave of intense interest of control of disease by this method. However, it was only a comparatively short time after this that Dubos arrived at the momentous conclusion that the soil held products which would control serious infectious disease. And following this there came Florey's decision to investigate the earlier work of Fleming and from this came penicillin and the entire antibiotic development.

The steroid development which followed Kendall's conclusion that hormones would relieve rheumatoid arthritis because arthritic women are relieved of the symptoms of the disease when they are pregnant, opened an entirely new field to the pharmaceutical researchers. And as application of these products demonstrated their importance in the control of many infectious conditions, the intensity of research interest in this class of products multiplied. Furthermore, all leading houses in the industry quite promptly took steps by which they were assured of a place in this class of products, since the place of steroid hormones in medicine of the future looks exceedingly important.

However, the product that has perhaps caused the greatest stir in the industry during the past year or so has not come from any of the classes of products which we have mentioned thus far. This was rauwolfia serpentina and its extractives. Here the industry went back to the botanicals—the original source of just about all remedies. Here the industry took a drug used for centuries in India and applied it, or its extractive alkaloids, to control of high blood pressure. And following the lead of practitioners in India, the drug is being tested for the treatment of insanity, epilepsy, insomnia, hysteria, and eclamosia. Older Indian literature describes the drug as a fever-reducing medication, as a remedy for snakebite, and as a cure for dysentery and other painful intestinal afflictions. Favorable reports on its use in control of mental disease in this country are appearing in the literature.

So here we have an outstanding example of the fact that while these various classes of drug products might appear to be played out after a short while of intensive research, they might still be the source of very important discoveries a long time after research interest in them has died down.

Certainly the application of rauwolfia serpentina or its alkaloids to the control of mental disease is no triumph for the medical profession or the pharmaceutical industry of this country. The drug was used by psychiatrists in India for this purpose, and all that was necessary was for the medical profession of this country to read these reports and then obtain the drug and see if these results could be duplicated.

But one clue that rauwolfia and its alkaloid, reserpine, have given to the medical profession and the pharmaceutical manufacturing industry of this country is the realization that mental disease apparently can be successfully controlled by drugs to a surprising extent. And perhaps it is about time that the medical profession and the pharmaceutical manufacturing industry of this country took time to tackle one of the most important, and thus far one of the most baffling, health problems that exists in this country. The only answer to the problem thus far has been to build more hospitals to contain the victims of this dreadful disease and then try to staff

(Continued on page 868)

MANICURE preparations

by Harry Hilfer

The nail lacquers and lacquer removers are the most important of the manicure preparations and have retained their popularity over a considerably long period of time. There have, however, been fluctuations in demand which seem to be closely correlated with current fashion trends, but the fact remains that they are still much in demand.

Almost all nail lacquers are formulated with nitrocellulose as its base. There was a flurry for a period during which new types of cellulose compounds became commercially available, but nitrocellulose still seems to be the lacquer best suited for nail enamel. The discussion which follows will therefore confine itself to lacquers made with nitrocellulose. This is a highly versatile compound in the sense that the procedure and degree of nitration could have a great bearing on its solubility in solvents and on the viscosity it imparts to the vehicle. In modern usage the choice is the so called ¼ to ½ second ester soluble type of nitrocellulose. Nitrocellulose itself has perhaps a greater degree of adhesiveness than do the other film forms and is therefore the overwhelming choice for lacquer formulation. Nitrocellulose has been the film former in use for lacquer for at least twenty-five years, but the lacquers themselves have been greatly changed during that period.

The most notable change has been a drift to the relatively highly pigmented films as compared to the clear films previously used, which in turn necessitated formula changes to compensate for the inclusion of the pigments. In addition a large number of new solvents, resins and plasticizers have made their appearance and are now being used in nail lacquer manufacture.

Nail enamels consist of four different classifications of components, the solvent, film former, resin and plasticizer—in addition to the pigments. The solvents are chosen primarily as the vehicle in which all the other components may be dissolved and also with a view to the drying time required. The solvents must therefore consist of a mixture in which all components are soluble. In common practice this mixture is chosen so that there is an initial relatively fast drying period until a point is reached at which the enamel surface is hard enough to withstand a gentle accidental abrasion. Slower dryers present in smaller concentration may then keep the solution intact and prevent separate precipitation of the various components, thereby allowing the formation of a single homogeneous film. There are a large number of solvents available for both purposes but the extremely fast evaporating solvents, though desirable from one standpoint are not in general use since too fast an evaporation rate cools the surface to a temperature low enough to cause condensation of atmospheric moisture on the film and interfere with its proper homogeniety because it would throw one or the several other components out of solution. Butyl acetate is the solvent that seems to be preferred since its boiling point and evaporation rate is at an optimum. Lower boiling point solvents may be used however in smaller amounts to accelerate evaporation. Ethyl acetate for example may be used, but acetone is not looked upon with favor. Methyl ethyl ketone, however is generally in use. The high boilers may be chosen from a large number of solvents of which ethylene glycol esters and ethers form a good part of the list, particularly the ester ethers. The solvent should be chosen with great care

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since it comprises the great bulk of the lacquer and a bad mixture could easily undo the work of an otherwise good lacquer.

The nitrocellulose film itself is brittle and hard. Since the human nail is a living organism and keeps growing, film must be made more flexible and less brittle so that it may adhere for a longer time than it would otherwise be possible. Plasticizers are introduced into the formula to make this compensation. The plasticizer may therefore be called a flexilizer. The important characteristic it must have is complete homogeneity with the nitrocellulose base. There are a large number available commercially so that a choice may be made to conform to the characteristics desired in the applied film. Generally speaking, these substances are divided into the liquid and solid plasticizers. Dimethyl phthalate, for example, would produce a softer film than would a solid plasticizer such as camphor. Actually both types are used together to impart the desired flexibility and hardness of film. The list of plasticizers is by no means limited to the two examples mentioned above but consists of a broad range having different viscosities and varying degrees of hardness. The concentration varies with the choice but usually has in a range of about 50 per cent of the nitrocellulose.

The film also should contain an additive the purpose of which is to increase its adherence to the nail. Resins are used for this purpose and with the advent of the synthetic resins, a greater formulation change has occurred in this section of the formula than in any other. The standard substances used before their advent are still in use however. Dammar gum, which has *(Continued on page 858)*

Modern INSECT Repellents

by Milton A. Lesser

There is no doubt that one of the major advances in recent years has been the development of chemicals to control insects. Prominent among these compounds, which contribute so much to the comfort and health of man, are the preparations which serve to repel insects from their prey. Now provided in a variety of convenient forms, insect repellents proved their worth for protecting troops from crawling and flying pests during the war.

This hard-gained knowledge has, of course, been well utilized in peace times. Nowadays outdoor workers, home gardeners, campers, picnickers, or families just sitting on their porches or in their backyards make use of these repellents to ward off mosquitoes, gnats, chiggers, and other insects.

Aside from the annoyance caused by their bites and stings, insects have always been a source of economic loss, illness and death to human beings. It should be remembered, for example, that mosquito-transmitted malaria and yellow fever remain major causes of death and debility in many parts of the world. In addition, the activities of these insects are a considerable hindrance to the development of vast tracts of land.

As pointed out by Allington and Allington,[1] insect bites may produce allergic reactions of various degrees of severity. Itching is, of course, a common symptom in insect bites and the rubbing and scratching provoked by this itching may result in erosion and excoriation. It is also noted that secondary infection frequently occurs in insect bites and may cause cellulitis, impetigo or ecthyma, folliculitis and furunculosis, or infectious eczematoid dermatitis.

These and other effects from insects have served to heighten interest in the formulation of effective repellents against these pests. Actually, the development of such products is a comparatively modern achievement.[2] The first really extensive research on mosquito repellents was made by Phillip Granett in New Jersey during the late 1930's. Research was greatly accelerated when, with our entrance into World War II, an acute need for insect repellents became apparent. With American troops being sent into infested jungles it became imperative that means be devised to protect the fighting men from disease-bearing insects. Research teams were set up in various parts of the country and literally thousands of organic chemical compounds were tested for their insectifugal action against mosquitoes, lice, mites, ticks, and other arthropods affecting the health of man.[3,4]

This intensive work resulted in the development of a number of useful insect repellent preparations that were recommended to the military services. Some of them have since been adapted to civilian use.[5] According to the Allingtons,[1] the commonest method of using repellents against mosquitoes, flies and biting gnats is to apply the preparation evenly to the backs of the hands, wrists, neck, ears, face, or other exposed skin, much as in washing. Repellents may also be rubbed lightly onto clothing through which bites occur. Against chiggers and grain itch mites, it is preferable that the active repellent materials be applied to the clothing rather than to the skin.

In passing it should be mentioned that considerable attention has been devoted to the development of repellents for impregnating clothing to afford long-time protection against insects. While such products are beyond the scope of this review, it is well to remember that some of the ingredients used in such repellents are the same as those included in liquids and creams that are applied to the skin. Of course, considerations with respect to repellency and toxicity are the same with both types of products, whether for application to the skin or to fabrics.

Although it appears that the ideal insect repellent still awaits development, standards for such a composition have been suggested from time to time. According to one view,[1] the ideal insect repellent should provide complete protection for several hours against all biting insects under all conditions of weather and infestation, should be nontoxic and nonirritating to the skin and mucous membranes, and should not have an unpleasant odor. In addition, it should be cheap, easily applied, harmless to clothing and possess an aesthetic feel and appearance.

Tests by Piper and his associates[6] in Canada showed that a boiling range of 230° to 260° C. was a favorable physical property of insect repellents. Compounds with low boiling points vaporized too rapidly, while those with high boiling points apparently failed to volatilize sufficiently to provide a protective atmosphere.

There is evidence that there are a number of variables which influence the action and effectiveness of insect repellents. According to Goldman,[7] some of these factors include: the moisture status of the skin, since dry skin may increase the repellency time; creep or movement of the repellent along the sulci of the surface; absorption of the substance by the skin; oxidation or other change in its chemical composition by the skin; the degree of mechanical application required; and the natural attraction presented by the host in the form of skin soil or the products of sweat or sebaceous gland activity. Brown's[8] studies indicated that body odors, as well as the color and texture of clothing influenced the biting tendencies of mosquitoes. Sweat-saturated clothes, for example, caused a doubling of the bite rate.

Obviously many of these variables cannot be taken into account when testing compounds for use as insect repellents. In making these tests the chemicals are first screened to determine their repellency, if any. Those passing this primary test are then subjected to controlled tests to determine their systemic toxicity, cutaneous irritation and sensitivity, and general suitability for use on humans.

Of the thousands of compounds submitted to repellency tests at Orlando, Fla.[9] and other entomologic research centers, only a small proportion has rated further examination. According to Travis and Smith,[10] less than 10 per cent of these chemicals were sufficiently effective to warrant more than the preliminary screening tests. Going further, the Food and Drug Administration considers only about three per cent of the promising materials safe for use on man.

Information obtained from these extensive studies indicates that the most effective compounds are mono- and polyalcohols, hydroxy esters, and hydroxy ketones possessing combined fat and water solubility.[8] Some of the more promising insect repellents have been patented. However, a large proportion of these patents[11-16] have been assigned to the United States Government and are thus readily available for use under license.

Actually, as noted by Smith and his associates,[17] of the numerous chemicals that have been tested as mosquito repellents, less than a score have proved highly effective and also safe for unrestricted application to the skin. It should be pointed out, however, that although a few of the newer compounds, like propyl N, N-diethylsuccinamate, are employed in insect repellent compositions, four time-tested chemicals remain the basis of most modern formulations. These are: dimethyl phthalate, dimethyl carbate, butopyronoxyl (Indalone), and 2-ethyl-1, 3-hexanediol (Rutgers 612).

These chemicals vary greatly in their effectiveness against different insects and on different individuals. Hence it is common practice to use these compounds in combination, experience having shown that mixtures of repellents are effective against a wider range of insect species and on more individuals than any one repellent used alone.[18] Most of the effective repellents are solvents of paints, varnishes and some of the plastics and should therefore be used cautiously around such materials. All of them cause some smarting when applied to mucous membranes, and they usually feel warm on the skin for a short period, especially if the skin is moist.[10] The materials should not be applied too liberally on the forehead or eyelids, since they may cause a temporary stinging if they get into the eyes.

Indicative of the status of these four compounds is the fact that they form the basis of the five repellent mixtures still being recommended by the U. S. Department of Agriculture experts.[18] These formulas are as follows:

	A	B	C	D	E
Dimethyl phthalate	4	3	3	2	2
Dimethyl carbate	3	—	1	—	1
2-Ethyl-1, 3-hexanediol	3	1	—	1	—
Indalone	—	1	1	—	—

Officially, formula A is designated as M-2020, formula B as M-250, and formula C as M-1616. It is noteworthy that M-2020 is one of the two compositions described in Military Specification MIL-R-249B (Oct. 7, 1953). This specification provides standards for insect repellents that may be applied directly on exposed skin surfaces or clothing to protect against mosquitoes and biting flies, gnats, fleas and chiggers (mites). The second formula, designated M-2043, consists of:

Dimethyl phthalate	40.0 per cent
2-Ethyl-1, 3-hexanediol	30.0 " "
Propyl N,N-diethylsuccinamate	30.0 " "

It is significant that, in tests[17] of mosquito-repellent mixtures, M-2020 and M-2043 rated highest as the

(Continued on page 862)

Aspects of Several ANTIBIOTICS*

part one Bacitracin

by Wm. Burdell Baker

DIRECTOR OF FIELD SALES, ANTIBIOTIC DIVISION, S. B. PENICK & CO., NEW YORK

The antibiotics within the confines of this report are *bacitracin, neomycin, tyrothricin, gramicidin,* and *candicidin.* The objective is an up-to-date recapitulation and commentary, incorporating many highlights of interest and value.

It will be noted that the antibiotics mentioned are those limited to topical or other local uses, and to certain uses by oral ingestion.

The only exception is bacitracin which, in addition, is valuable for systemic use. But while the systemic use of bacitracin is accepted today, with clinical assurance of its value, its present largest uses are for the non-systemic purposes mentioned.

Bacitracin

In 1943, bacitracin was recovered at Columbia University during a study of the bacterial flora of contaminated wounds. A particular strain of *Bacillus sublilis* was isolated from a compound fracture of a seven-year-old child named Tracey. Hence its name, "bacitracin."[4,5]

Properties: Bacitracin is a polypeptide. It is a white hygroscopic powder, soluble in water, ethanol, methanol, isopropanol, cyclohexanol, and *n*-butanol; slightly soluble in cyclohexanone; insoluble in chloroform, benzene, acetone, ether, and ethyl acetate. It is relatively heat stable, and withstands heating for 15 minutes at 100° C. without significant loss of titer. Two weeks' incubation at 35° to 37° C. has been shown to inactivate the drug. However, it is much more stable at refrigeration temperatures, and this should be the storage procedure of choice for bulk bacitracin. On the other hand, pharmaceutical products of dry forms (tablets, capsules, non-aqueous ointments, etc.) containing bacitracin are usually quite stable for practical marketing purposes, especially when protected from moisture and excessive heat.

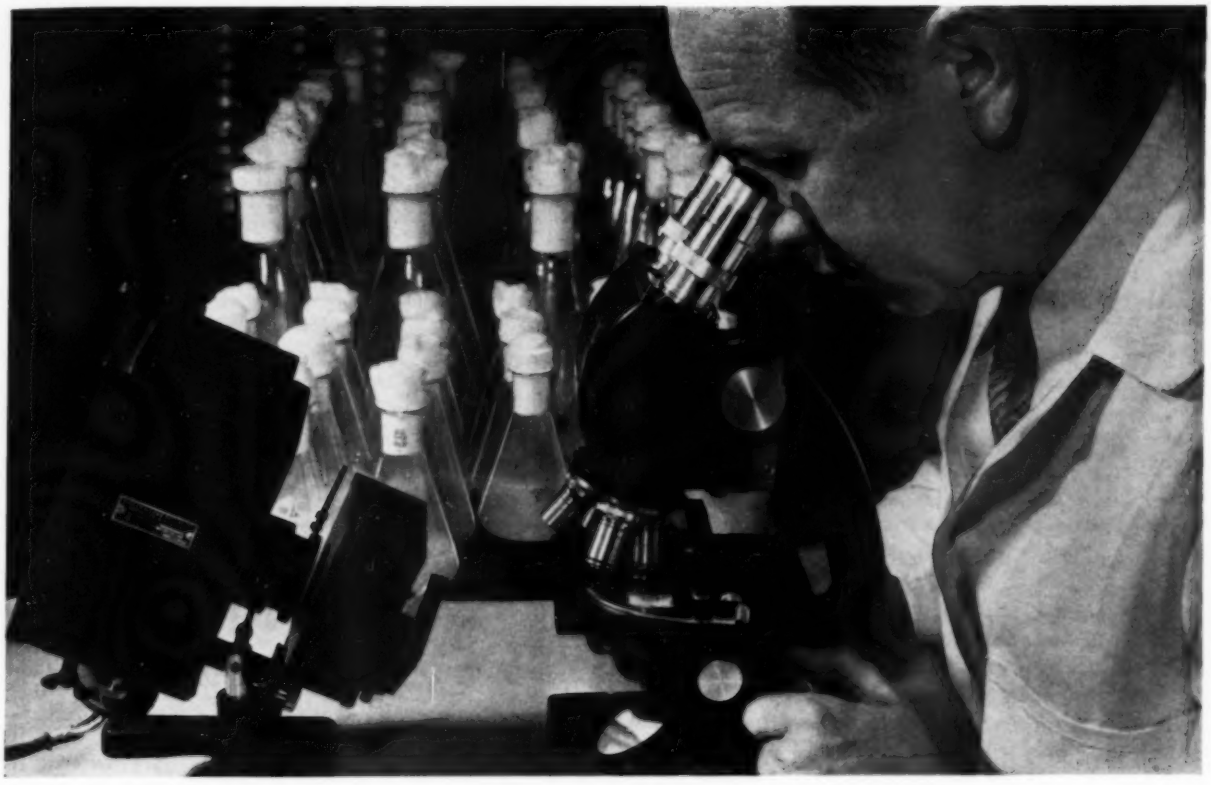
The regulations of the Food and Drug Administration permit as much as five per cent moisture in tablet forms, and one per cent in ointments. If proper storage of bulk bacitracin is observed, and correct pharmaceutical technic of handling is observed from the beginning of formulation and through the packaging stage, these conditions are not difficult for the pharmaceutical manufacturer to meet.

While bacitracin is more stable in slightly acid solution at 0° to 5° C., it is unstable in alkaline solution above pH 9.0.[4-11] The drug is not sufficiently stable in water contact for marketable aqueous solutions, consequently where such use is desired a dry-fill or lyophilized product, to be reconstituted just before use, is indicated. In such products, after reconstitution with water, the solution is suitable for extemporaneous use, and should maintain its potency for several days or more, especially at refrigeration temperature.

Bacitracin is a neutral substance and cannot be precipitated from the original harvest by manipulation of the pH, and it is filterable through a Berkefeld or Chamberland filter. It resists digestion with pepsin or trypsin.[4-11]

Compatibility and Incompatibility: Among the agents with which bacitracin is compatible are: other antibiotics, sulfonamides, arsanilates, nitrofurazone, nitrophenide, etc.[12] It is inactivated by sodium thiosulfate, hydrogen peroxide, and BAL (Dimercaprol). It is precipitated by salts of heavy metals, tannic acid, benzoic acid, salicylic acid, trichloroacetic acid, high concentrations of sodium chloride, acetone, ammonium rhodanilate, molybdic acid, Reinecke's solution.[11]

*Presented, in part, at the meeting of the Research and Development Section, American Drug Manufacturers Association, Atlantic City, N. J., October 7-9, 1954.



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Reference Standard: During the past year, an International Standard has been established for bacitracin.[13] This was authorized by the World Health Organization Expert Committee on Biological Standardization, and the work was done by the Department of Biological Standards, National Institute for Medical Research, London. Comparison was made with the proposed bacitracin of the United States Food and Drug Administration.

The International Standard contains 55 International Units of activity, and therefore the International Unit has been defined as the activity contained in 0.0182 mg. of the International Standard for bacitracin. In other words, 1 mg. of the International Standard contains 55 International Units of activity.

Range of Activity: Bacitracin has a wide antibiotic spectrum effective against Gram-positive organisms such as staphylococci, streptococci, pneumococci, meningococci, and anaerobic cocci.[14-15] Its bacterial spectrum is quite similar to penicillin.[5-16-17] It is not inhibited by the penicillinase producers which are often present in mixed infections. It has been noted that clinical response to bacitracin is about as good in mixed-organism infections as in pure infections. Also, it is not inhibited by blood, pus, serum, or necrotic tissue.[5-14] On the other hand, it is relatively inactive against most pathogenic Gram-negative organisms, except the gonococcus and meningococcus; which are highly susceptible to the drug.

Absorption and Excretion: Bacitracin is not absorbed from the gastrointestinal tract to any significant extent. If any effects from slight absorption occur, it must be mild; and not sufficient to necessitate modification or interruption of therapy.[5-18]

The total urinary excretion of bacitracin in man is 87 per cent in six hours the rate of excretion in the first hour being one-third that of penicillin G potassium. After two hours, the excretion is more than five times as rapid.[9]

Bacitracin Uses: Present major uses include its action in the treatment of pyogenic skin infections, open wounds, eye and nasal infections, mild pharyngeal and tonsillar infections, amebic and bacillary dysenteries.[1-19] It is evidently necessary, in effecting a cure, that bacitracin come in direct contact with the infecting organisms. This is true whether the drug is to be used in pharmaceutical products for skin infections, or in lozenges for throat infections.[20-21]

Dermatological Use: The superiority of the drug in *pyogenic* skin infections is quite understandable, in view of the fact that the important causative organisms found are Gram-positive pyogenic cocci. It is said that Gram-negative organisms probably play an insignificant part in such infections, except those found in otitis externa and media.[22]

In addition to its effects against the classes of organisms mentioned under *Range of Activity*, bacitracin is

also effective against *Clostridium welchii*, some of the actinomycetes, *Treponema pallidum*, and others.

In the treatment of superficial pyodermas, such as impetigo contagioso and infectious eczematoid dermatitis, response to bacitracin is very rapid, often within 48 hours; and the drug has been called the most efficient topical application in the treatment of pyodermas.[20,24]

Numerous investigators have been in agreement on the efficacy of bacitracin in the treatment of various local skin infections,[25,24,17,16,27,22] etc.

In the first one hundred cases of surgical infections studied, of which 83 per cent responded favorably, bacteriologic studies revealed that the majority of such infections are due to a mixture of organisms. When the organisms associated with these infections were tested for susceptibility to the action of bacitracin, thirty were susceptible, and only six were resistant. In a later series of two hundred seventy cases, this susceptibility ratio, especially as compared to penicillin, was much greater than in the earlier study.[28,29]

By and large, in dermatological and local surgical infections, resistance of susceptible bacteria appears to be inconsequential with bacitracin.[28,5]

Sensitivity: When selecting a drug for therapy, the drug of choice is very often the one that elicits the lowest rate of sensitivity in patients. In the use of bacitracin, many dermatologists had been impressed from the early days of usage, by the low incidence of allergic reactions, as contrasted with other agents, whether antibiotics or chemicals. This good impression of bacitracin has been maintained with continued experiences, during the past several years, and right up to the present time.[25,30,31,20,16,32,14,23,22]

For instance, one group of investigators studied bacitracin for sensitivity in two hundred eighty-eight human patients, patch-testing with bacitracin ointment (1000 units per gram) for 48 hours. All of the patients were negative for sensitivity, except one. In this patient, a case of dermatitis occurred. However, he was also allergic to the petrolatum in the ointment; but also reacted violently to liquid petrolatum, olive oil, wool fat, soy bean oil bases, lard, carbowax, greaseless ointment bases, sulfonamides, and quinolines.[20]

Another clinician, after noting that not a single instance of allergy or irritation occurred in four hundred patients that he treated, stated that either the incidence of total hypersensitivity of the drug is extremely low, or else the period required for the local allergy to develop, if it develops at all, is an unusually long time.[9] Still others consider bacitracin the least allergenic of local agents currently used, and place the sensitization rate at less than 0.5 per cent.[32]

One explanation given for bacitracin's virtual freedom of allergic activity, as compared to most other antibiotics, is that bacitracin is of bacterial origin; whereas other antibiotics are derived from fungi and moulds.[16]

It is noteworthy that lack of irritation is an important attribute of bacitracin, since it is mandatory to avoid agents which have any tendency to irritate the skin.[34]

Other Local Uses. Ophthalmic: The potential value of bacitracin in the treatment of many eye infections became obvious in the light of the effectiveness against most Gram-positive organisms.[39] Subsequent clinical findings resulted in its being thought of, by certain investigators, as the drug of choice in ophthalmic infections; because of its effectiveness as a local bactericide, its non-irritating nature, and its low incidence of allergic reactions.[30,16]

For instance, one of these investigators treated more than four hundred patients with infections such as blepharitis, conjunctivitis, corneal ulceration, etc., and all of the patients were benefited.[16]

Pharyngeal and Aural: Bacitracin is useful in the treatment of mild, acute and chronic, pharyngeal and tonsillar infections: for instance, in a dosage of 1000 units of the antibiotic in lozenge form.[19] When such infections become severe and deeper infection has occurred, local treatment may not be efficacious because of the continual washing effect of the saliva.[21]

The antibiotic has also been employed in aural infections with good results, especially in the treatment of fenestration cavities.[19]

Oral Administration; Amebic Dysentery: The major indication for oral ingestion of bacitracin, with the objective of reaching the gastro-intestinal tract for contact with susceptible organisms, is in the treatment of certain protozoan infections, such as amebic dysentery.

The search for safe and efficient amebacidal agents has been a long and continuous one and the therapy of amebiasis has long been a controversial issue.[36] It has just been in the past few years that an antibiotic has been shown to be effective, apparently by actual destruction of the offending organism, *Endamoeba histolytica*, in the treatment of amebic dysentery.[37,38,39]

Since then, the investigation into the possible effectiveness of other antibiotics has been stimulated. The investigations have gone forth in spite of the difficulties in interpretation of results, and lack of adequate controls, in the *in vivo* testing of potential amebacides, when such agents are also shown to exhibit bacteriostatic action; and with the realization that amebacidal action may not be due to direct action of the agent on the ameba, but perhaps through indirect action, for instance, through inhibition of the accompanying bacterial flora.[40,41]

Nevertheless, the treatment of human amebiasis has undergone a marked transition with the advent of antibiotics, since these drugs are much less toxic than those amebacidal agents which have been used routinely; such as the arsenic and iodine compounds, emetine, etc.[42] Furthermore, quite often, the clinical results with certain antibiotics are equally as good and more rapidly attained.

In view of the generally good results obtained with several of the antibiotics, and in spite of the seeming shortcomings in the hands of some investigators, some

(Continued on page 834)

EMULSIFIED LOTIONS

CONDENSED FROM A FORTHCOMING BOOK

by Wm. R. Keithler

COURTESY RICHARD HUDNUT

These products are very much like the liquid cream and, in fact, can be classified as such. They are usually oil-in-water emulsions and contain an emulsifier, a humectant, an emollient, a bodying agent, and water. In most cases it is also necessary to add a preservative. The p-hydroxybenzoates are usually used for this purpose.

The function of a hand or body lotion is to soften the skin and assist in the prevention of chapping. It is safe to say that the biggest part of the lotions advertised as hand and body lotions are used on the hands. This stands to reason, as the hands are subjected to so very many different environments. A good hand lotion must soothe and soften the hands, without leaving a greasy clammy feel. It must rub in quickly, so that the user does not have to rub for twenty minutes. A pleasant odor is essential, and finally, it must be very stable to temperature, light, and humidity.

These emulsions are based upon the same emulsifying agents, and emulsifiers, as many of the other creams. Triethanolamine stearate and oleate are very common. These soaps are white and stable. Sodium hydroxide and potassium hydroxide are very seldom used, as they tend to produce stiffer, harder creams. Stearic acid soaps can be formulated so as to produce a characteristic pearl in the finished product, whereas the oleate soap cannot.

Glyceryl monostearate, either in combination with other soaps or alone, is used as an emulsifier in hand lotion. The emulsions made with this compound are very stable and possess a pH of about seven. Lotions prepared with glyceryl monostearate are usually very heavy and thick. For this reason, combination soaps give best results. The glyceryl monostearate also provides emollient properties to the finished product.

Amino glycol, 2-amino-2-methyl-1,3-propandiol, is also used to some extent in these products. It produces a cream much like triethanolamine. That is, very white, and of low viscosity. Other amino alcohols, such as 2-amino-2-methyl-1-propanol, are even less frequently used.

The emollients used in hand lotions are limited to a comparative few. Lanolin is most popular. It is used to the extent of from two per cent to five per cent. Lecithin is less often encountered. Cetyl alcohol is an excellent emollient, and also acts as a thickening agent. From one to two per cent is the common quantity used in hand lotion. Larger percentages tend to produce too heavy and thick an emulsion, and there is the possibility of granulation in the lotion. Stearyl alcohol, sometimes, in combination with oleyl alcohol is used for the same purpose. It has a greater stiffening power than cetyl alcohol.

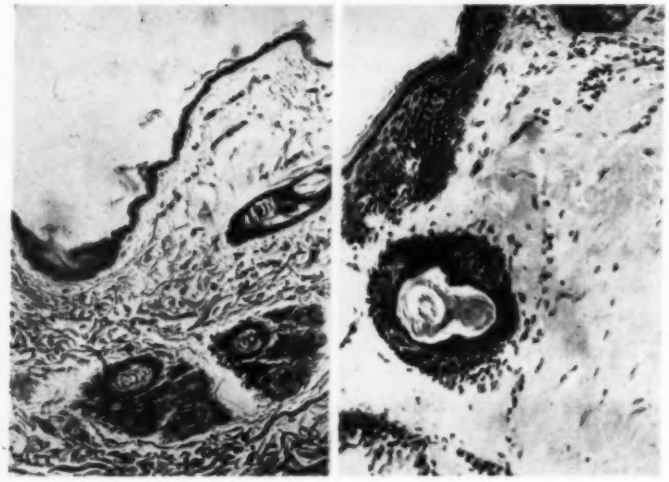
Some vegetable oils, such as almond, olive, sesame, cottonseed, peanut, and corn oil are of value in hand lotions. They are used because of the lipophylic groups contained in them, allowing a certain amount of skin absorption. Olive and cottonseed oils are most popular. It must be remembered that formulations containing vegetable oils must be well preserved, as they are prone to both contamination and oxidation.

A small amount of alcohol, especially in a formula high in solids, will help to alleviate the clammy after-feel of various formulations. It will also speed up the rub-in time if used in the proper ratio. Alcohol must be used with some reserve, for its improper use can result in an unstable product.

The humectant is a very important part of a hand lotion. The polyhydric alcohols all exhibit humectant properties which vary with the structure of the alcohol. Glycerine, of course, is very widely used, but due to its cost has been replaced, at least to some extent, by sorbitol, mannitol, and some of the glycols. According to latest research, many workers have reported, and are of the opinion, that the sugar alcohols such as sorbitol are superior to glycerine and the glycols, at least in products like hand lotion. No matter which humectant is

(Continued on page 860)

Fig. I. Photomicrograph Cat and Human Skin.



Animal and Human

by Eugene F. Traub, M.D., and Herbert J. Spoor, Ph.D., M.D.***

Fig. II. Patch Test Setup

In general there is a direct interdependence between animal and human testing so that rather than a correlation of the two, one should attempt to assign each method to its most useful sphere. In general, gross toxic effects, both systemic and dermal can be best detected through animal work, but the more subtle reactions such as those leading to dermatoses or absorption phenomena, require human test subjects. In this discussion we are dividing those methods into animal and human type. This separation is rather artificial. An adequate workup on any new process chemical or new ingredient of a formula requires both animal and human study. Dr. Hazelton[1] has presented many of the animal methods used and explained the purposes of animal toxicity testing, but there are several limitations of animal work which we feel could be reemphasized. Primarily, one must use care in the selection of the test animal. The behavior of the guinea pig, rat, rabbit or other animal skin may vary with both species and strain. Species variation is well shown by the behavior of penicillin. This drug is virtually free of all dosage related toxicity for all animals except the guinea pig. For this animal species, penicillin is very toxic.[2] Variation between strains of the same species has been shown to depend upon such things as diet alone. For example, relatively minor variations in diet are sufficient to change the pattern of animal response to topically applied chemicals.[3] The skin of the lower animal also differs physically from that of man. An essential point here is that the skin of most laboratory animals is devoid of sweat glands. As a result the human skin is generally more moist than is that of an animal, and with a moist corneum, the absorption of a topically applied agent may be inhibited, according to recent work by Butcher.[4] This is an interesting observation because we dermatologists have always felt that absorption was enhanced through increased water solubility. Another observed difference is that the epidermis of the human skin is relatively thick as compared to that of the animal. In addition, the true skin or dermis of the human skin contains fewer hair follicles and is much less tough than is that of the animal. (This histological difference is shown in Figure I).

There are also limitations to the human test methods.

*Professor Dermatology, New York Medical College Medical Director, The Skin and Cancer Hospital of Philadelphia.

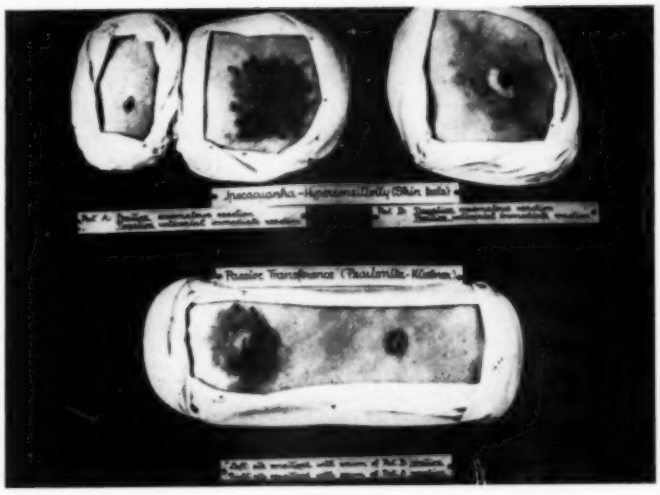
**Research Director with the rank of Assistant Professor, Department of Dermatology, New York Medical College.

†From a paper delivered at Society of Cosmetic Chemists Seminar, September 23.

There is variation in the skin and in its responsiveness. For example, the inadvisability of using the colored skin for patch testing has been established. Care must be taken to avoid seasonal variations. It is also true that there is a tremendous variation in responsiveness of a skin depending upon its clinical condition. More practical limitations are the facts that we have difficulty in obtaining objective measurements of skin change, especially if these measurements require the removal of tissue. Perhaps incidental is the cost involved in obtaining an adequate number of subjects for trial. On this point of numbers one must be sure to obtain a proper balance between that number required for a clinical impression and that number considered valid by the statistician.

Nevertheless, with all their limitations both animal and human test methods are useful, and both are required to grade correctly the dermal toxicity of any product.

Fig. III. Reaction Types on Skin



SKIN TESTING†

Experimental Data

Regardless of the difficulties which may arise in theorizing or in ascertaining how a chemical agent may affect the skin, several good test methods have been developed, so that a particular substance which has caused or might cause trouble usually can be identified. On animal skin probably the most satisfactory method of testing is a repeated intradermal insult—the guinea pig test of Landsteiner and Jacobs, more recently advocated by Draize; while on the human skin the closed patch technique ranks among the best. This human test requires that a closed patch containing the study material be applied for 48 hours. After removal, readings for erythema, induration and vesiculation are made. Two weeks later the patches are repeated at approximately the same sites and again after 48 hours the skin response readings are made. Gradations of reaction are expressed by the symbols 1 plus to 4 plus inclusive. Thus, erythema of the area of the skin to which the chemical was applied is indicated by 1 plus, erythema and edema by 2 plus, erythema, edema and vesiculation by 3 plus, and any greater reaction, including erosion by 4 plus. The mechanics of the patch test are shown in Figure II, while characteristic skin reactions which might be observed are shown in Figure III.

In addition to the classic irritation response there is a delayed reaction which often presents itself as a questionable erythema, but which over a period of several days or a week gradually becomes a real ery-

(Continued on page 834)

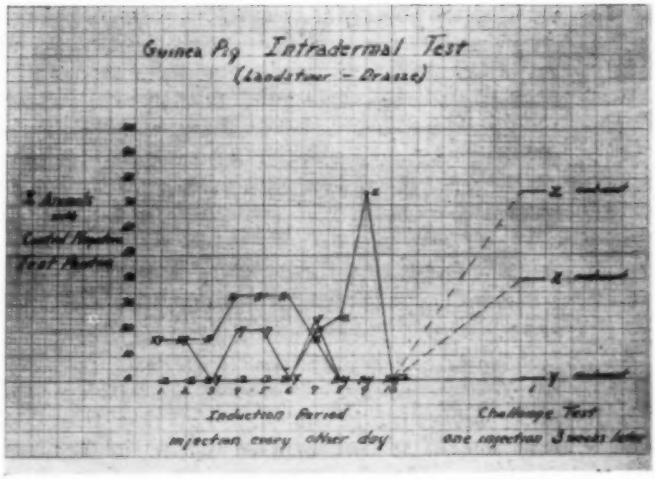


Fig. IV. Guinea Pig Intradermals—Ointments.

the SUNTAN INDUSTRY

by L. Stambovsky

part three Sunscreens

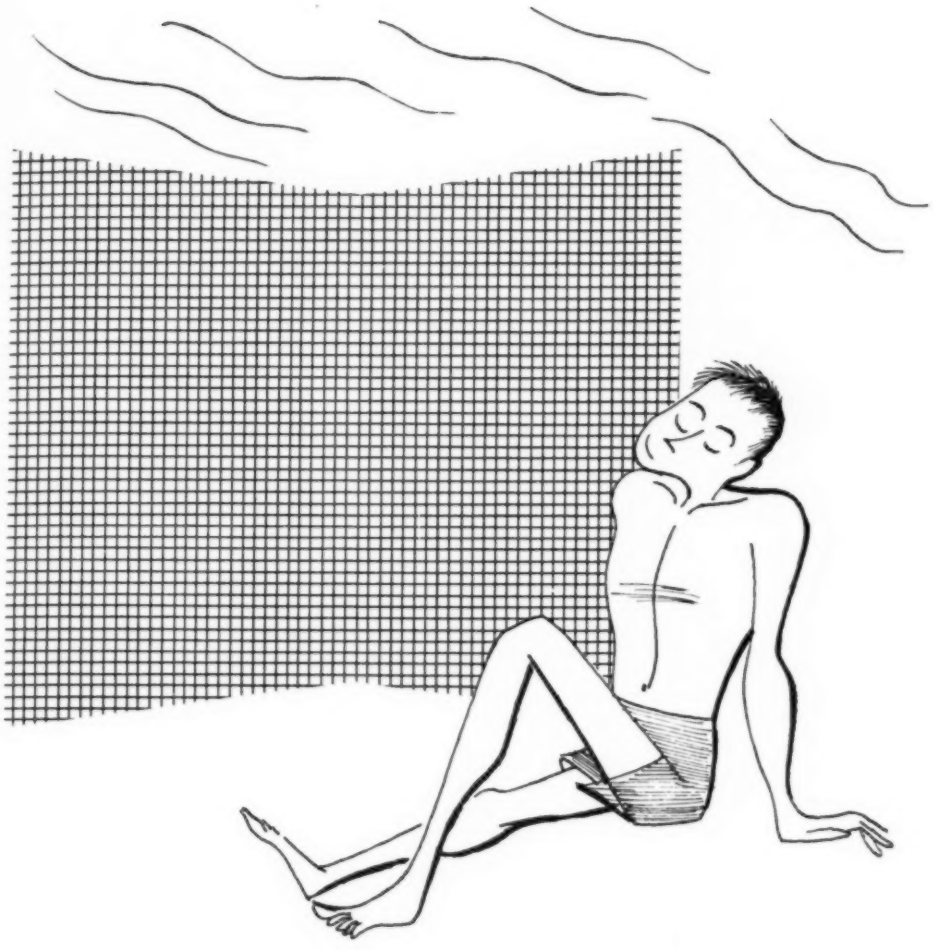
The entire subject of sunscreens, or sunfilters as they are popularly called, has been a confused wilderness of fantastic claims, uncertain objectives and ignorance. A few examples illuminating this situation may be found in a previous discussion.[23] Those manufacturing suntan lotions have been, to a greater or lesser degree, dependent upon the honesty and scientific acumen of the sunscreen manufacturer. Unfortunately such confidence has in too many instances been unwarranted. This is not meant to impugn the integrity of those so engaged. Insufficient research and field study, and the paucity of reliable information regarding sunburn prevention are the guilty factors involved in the promotion of inefficient compounds.

Specifications and Sunscreens

The demands made upon these agents are manifold and inexorable. The first essential is that the compound function effectively in the desired spectral ranges. The burning or erythemogenic rays of the solar spectrum reside between 2950 and somewhat less than 3150 Angstrom units; these wave-lengths are also, simultaneously, strongly pigmentogenic. The radiant energy beyond 3150 Angstroms is beneficial inasmuch as it is practically non-erythemogenic and does possess direct or immediate tanning properties. Therefore a sunburn preventive should absorb, transform or restrict solar radiation only between 2950 and 3150 Angstroms, in such a measure that excessive erythema or injury be prevented within the average daily exposure. Wavelengths above 3150 Angstroms should be permitted to pass freely for reasons already mentioned. A number of chemicals will spectrographically conform to such an absorption curve and will produce beautiful spectograms with almost total extinction in the erythemogenic zone. Under no circumstance should this be accepted as a barometer of quantitative capacity. Past experience has proven that the great majority of sunscreens, with but few exceptions, which yielded perfect spectrograms, in actual field use required inordinately high concentrations to provide adequate protection.

The matter of concentration is of utmost importance insofar as dermatologic innoccuity is concerned. No compound should even be proposed for use as a sunscreen without a reasonably authentic reputation for local and systemic innocence. We assume that the compounds under consideration do qualify in the above respect and we may proceed from that point. Despite the most guiltless background, there are very concrete possibilities of disagreeable repercussions attendant upon the contact of almost any chemical with the skin when conveyed in a sunburn preventive. This is fact by virtue of the extraordinary situations and conditions to which sunscreens are subjected, and which in turn, engender antagonistic and discordant phenomena in both the integument and the chemical screen. Therefore, a compound which is generally accepted as completely harmless, might, under the circumstances outlined, reveal an entirely different behavior.

A broad classification of the dermatologic pathologies that might be induced by the application of any chemical on the epidermis would include irritation, allergenicity and sensitization. The potential for any, or all, of these untoward reactions is increased by concentrations of active screening compound and is decreased by minimal amounts of same. Chemicals in very large number have been advanced as sunscreens which would offer



more or less satisfactory service—if employed in sufficiently and excessively high concentrations. For instance the salicylates are extensively used but require not less than a 10 per cent concentration. Para-aminobenzoic acid is said to perform efficiently in a fifteen per cent suspension. In each of these cases we have present formidable quantities of chemicals that cannot positively be guaranteed to be devoid of the ability to precipitate unfavorable dermatologic responses. This is particularly true in sunburn preventives where the impact with multiple, harsh influences renders chemical and dermatologic stability a difficult status to preserve.

A classic illustration of lack of familiarity with the potential side effects of all chemicals may be found in the story of one of the most successful suntan lotions. This product was one of the first to furnish the consumer with demonstrable protection from excess insolation. The public soon became aware of its excellence and sales mounted higher and higher. Unfortunately one factor was overlooked, compatibility of the skin with the screening material. The compounds contained in this lotion, benzyl salicylate and benzyl cinnamate to a total of about seven per cent, provoked an unpleasant stinging sensation where applied, especially during and after immersion. The writer discovered this phenomenon at the retail drug counter, where spontaneous comment or interrogation, or both, revealed this offensive trait. The manufacturer, too, must have been informed through volumes of complaints since the two agents responsible for the above have been replaced by more friendly screens. The salient aspect of the foregoing is this: seven per cent of any chemical is, dermatologically speaking, to be reckoned with. If these two filters could have, in a two or three per cent concentration, absorbed erythemogenic radiation comparable to that obtained with seven per cent, it is entirely possible that the aforementioned dermatitis would have been mitigated to a tolerable degree or perhaps completely eliminated. Obviously the higher concentration was employed for the very elemental reason that the lower percentages would have failed to shield the skin from actinic injury.

All Chemicals Dermatologically Suspicious

With justification born of field experience and observation, the writer takes the liberty to again repeat a dermatologic axiom of paramount importance; namely, that every chemical no matter how benign, including water, can under certain incidental events, elicit a disagreeable and sometimes distressing skin reaction. This is preeminently true for sunscreens which in their im-

plementation encounter a multitude of bizarre and abnormal conditions which predispose a Jekyl and Hyde behavior.

Factors Facilitating Side Reactions

These factors are manifold, fluctuating and subtle: the very young and the very old possess extremely delicate or sensitive integuments with a very limited tolerance towards foreign substances. Sunburn preventives are intended to be used by sunbathers of all ages and we have herein a very definite contingency insofar as cutaneous innocuity is concerned. Sensitization, exogenous, (external), and endogenous (internal), is a very distinct possibility. The definition of sensitization may be summed up by saying it is the development of an abnormal sensitivity or abhorrence towards certain compounds manifest by pathologic cutaneous symptoms such as pruritis, rash, erythema, urticaria and other various types of eruptions and eczematoid syndromes. Among the exogenous sensitizers would be included the earlier application of offensive antiseptics, topical sulfas, coal tar and other dermatologic medications. Also contact with certain types of fibers such as nylon, wool, etc., clothing dyes and a host of other substances with which the skin would come into intimate proximity. Still other exogenous influences are the excessive use of soap which changes the acid mantle of the skin and simultaneously removes protective lipoids therefrom by emulsification, saponification and suspension. Deodorants and perfumes are not without guilt in depreciating dermatologic balance.

Endogenously induced sensitization has been observed after the ingestion of sulfas, hypnotics (barbiturates, etc.), and a huge number of other medicaments. Other endogenous factors are inherited cutaneous abnormalities, systemic infections, glandular disturbances and general physical deterioration. Many field conditions will contribute towards hyper-sensitivity of the skin. Excessive perspiration and maceration must be regarded as a common and definite depressant of skin tolerance to the presence of chemicals. The individual or combined effects of infra-red, visible and ultra-violet spectra are easily capable of disturbing a delicate epidermal equilibrium. Slight changes in the screen itself engendered by the entire solar spectrum, assisted by perspiration, might exert just sufficient control to upset a precarious balance between the skin and the chemical sunscreen.

Time of Contact and Chemical Dermatitis

The element of time plays a material role in the genesis of chemical dermatitis. Applying a topical medication over a small area for several hours or at least for a limited time might not evoke any unfavorable dermatologic response; the presence of a chemical sunscreen remaining on the entire twenty square feet of body surface, (minus minimum legal coverage), for four or more hours, day after day, merging into weeks and possibly an entire summer, is an entirely different matter. Such extended periods of contact over vast dermal areas would most certainly incline the skin to manifest some sort of protest.

We have brought to the surface the multiple conditions and situations capable of predisposing the skin towards undesirable reactions during the use of suntan preparations. These factors are numerous and in the functioning of a sunburn preventive are omnipresent. This entire discussion of potential side effects was intentionally over-stressed as a strenuous effort to impress those interested with an aspect of the suntan industry which demands much greater respect than it has been accorded heretofore. In recapitulation, the fact remains, that attending the use of all anti-erythemogenic chemicals is the inherent and ubiquitous risk of unpleasant cutaneous reactions; no amount of laboratory or clinical study, or manufacturer's assurance to the contrary, can completely refute this claim. The hazards depicted can be potentiated or minimized, being dependent upon formulation. High concentrations of any screening material will increase the possibility of irritation, allergenicity and sensitization, and inversely, although not necessarily in direct proportion, low concentrations will reduce said potentiality. In view of the above postulate, an absolute minimum of screening compound, commensurate with competent protection against solar burns should be employed.

Dermatologic Tests for Side Effects

The question of dermatologic side reactions to chemical sunscreens should be seriously investigated, if much grief and expense are to be avoided at a much later date. This does not mean a few patch tests on rabbits or guinea pigs, or even humans, which, in a slight if any degree, parallel the aggravating factors in action when a sunburn preventive is employed in actual service. Tests should as far as possible duplicate all forces involved under a hot sun which intensify the vulnerability of the skin. Basic reasoning indicates that laboratory or clinical examinations for dermatologic safety will not be valid for field behavior, unless all active forces encountered in practical application are permitted to exercise their effects during analysis.

Minimum and Maximum Concentrations

At the present writing no known single sunscreen can offer comprehensive defense against excess solar irradiation under the conditions of today's sunbathing habits, in a concentration of less than two per cent. Several newly sponsored compounds claim otherwise but the crucible of erythemal examination will reveal incompetency. In light of the above, it is abundantly clear by virtue of no choice, that two per cent is the minimum concentration compatible with a successful product. The writer claims that five per cent is the unequivocal maximum of any screening compound or

(Continued on page 826)

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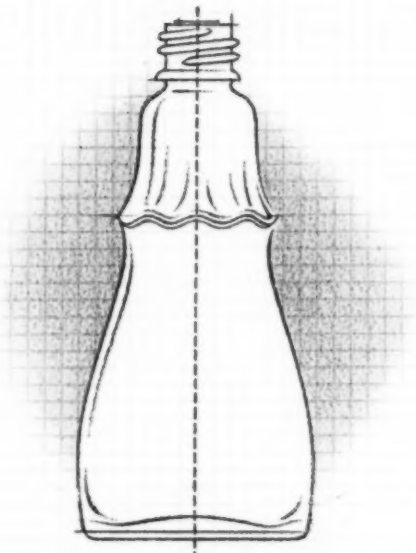
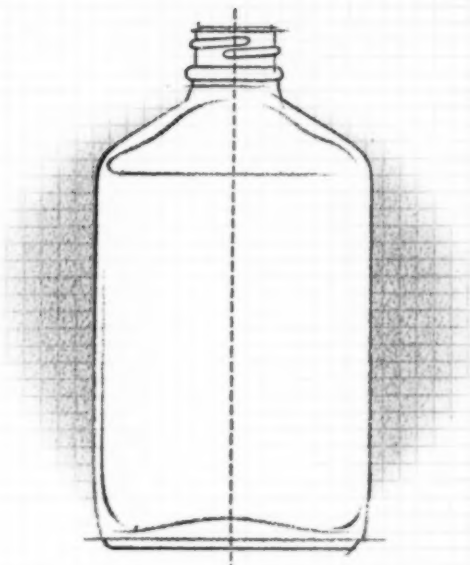
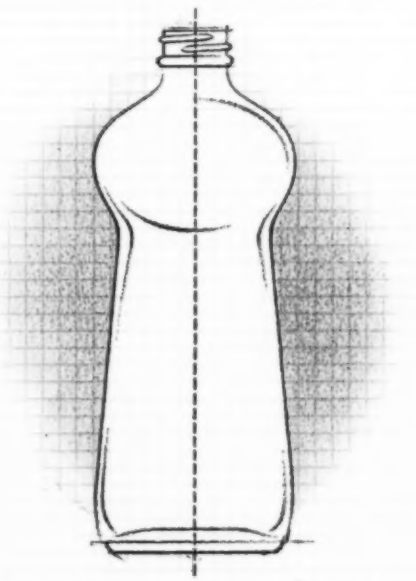


It may be born of the talent of its designer to picture the virtues of a product by the grace and beauty of its container.



It may be born from necessary emphasis on the protection of its contents from every outside influence.



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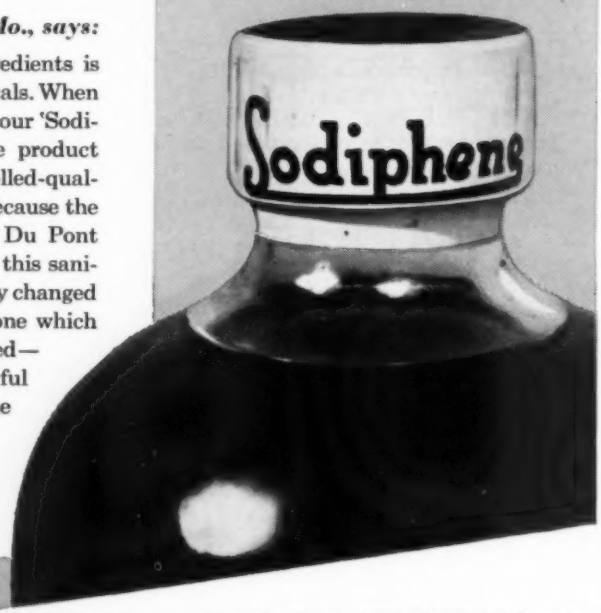

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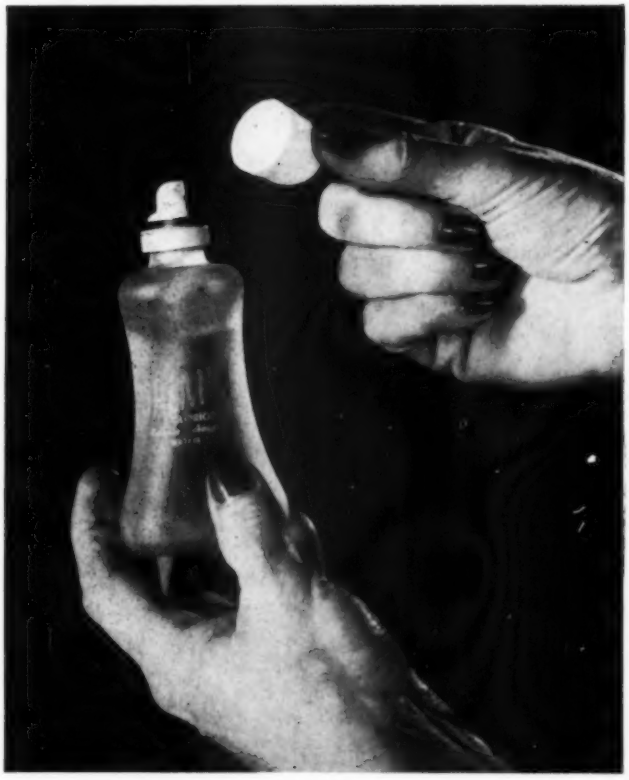
TECHNICAL DIRECTOR, ZONITE PRODUCTS CORP.

and Dr. Mason E. Wescott,
PROFESSOR OF APPLIED STATISTICS,
UNIVERSITY COLLEGE, RUTGERS UNIVERSITY,
NEW BRUNSWICK, N. J.



COURTESY ZONITE PRODUCTS CORP.

Figure 1

During the latter part of 1953 the first glass aerosol[1] made its debut in the form of an attractive frosted and screened 2-oz. round bottle, utilizing the Ultra-Low Pressure System for dispensing alcohol-based products with pressures of 11 to 15 p.s.i.g.[2]

By early 1954, a second shape was commercially available in the form of a 2 oz. oval bottle.

Subsequently, a third design "teardrop" was introduced following completion of the tests reported by this paper on the round and oval shapes.*

How safe were these bottles? Was bottle shape a factor affecting safety? Did environmental temperature make any difference in the relative safety of these bottles? How about their safety when full as compared to that after the contents had been partially exhausted?

Answers to these questions should be sought before releasing for commercial distribution a pressure-dispensed liquid in an unprotected glass container even with pressures as low as 11 to 15 p.s.i.g. This paper will report experiments made to provide answers to the above questions as they relate to the round and oval bottles. The experiments were designed jointly by the authors of this paper, and their execution supervised by one of us (FAM) in the laboratories of Zonite Products Corporation, New Brunswick, New Jersey, during the spring of 1954.

*Drop tests on this teardrop shape, made in conformance with the pattern worked out for the other two shapes, gave comparable results with one exception: the number of drops required to break the teardrop shape was, on the average, significantly greater than that required to break the round shape. This would indicate that shape can play an important part in the structural strength of the bottle design.

Preliminary Tests

To begin with, a standard of comparison was needed —a "control." It never has been intended to claim that these aerosol bottles are *absolutely* safe—no unprotected glass bottle containing liquid under pressure possesses such assurance. Nor can such assurance be given even to bottles not under pressure, e.g., medicine bottles. But how would these 2 oz. pressure bottles rate when compared on the score of resistance-to-breakage with some commercial product containing pressurized liquid in an unprotected glass bottle and already widely accepted by the public from the standpoint of safety?

Ordinary beverage bottles meet this requirement—beer, the various colas, soda water, ginger-ales, etc. These come in various shapes and sizes, up to as much as 32 fl. oz., have internal pressures considerably higher than 15 p.s.i.g., are shipped and stored under a wide variety of environmental and handling conditions, and are accepted and used by the general public without apprehension as to safety—children frequently carry them around in wire baskets on bicycles. How do beverage bottles behave with respect to resistance-to-breakage when subjected to a standardized drop test? More importantly, how do the pressure bottles of interest to this study behave with respect to resistance-to-breakage when compared with ordinary beverage bottles under standard conditions of test?

A variety of commercially available beverage bottles were dropped from rest to strike on the side of the bottle

LOOK AT THE FLOOR . . .

for proof this cap cuts costs

Just make this simple test: Run Armstrong Hi-Tork® Caps for a day or two . . . and keep an eye on the floor. You'll see the difference right away. There'll be no litter of broken caps on the floor when you're running Hi-Torks!

They give you less breakage because they're stronger. Each part—dome, skirt, and thread—gets exactly the plastic it needs to stand up under the torque and impact it has to take. That extra strength means less downtime . . . and lower costs.

We'll be glad to help set up a test run. Just get in touch with your Armstrong man or write Armstrong Cork Company, Glass and Closure Division, 5312 Chambers Street, Lancaster, Pennsylvania.

Armstrong "HI-TORK" MOLDED CAPS

on a plain, smooth-surfaced concrete floor. It was found that all such bottles dropped in this way consistently broke on the first drop when the height of drop was four feet. A few of them survived one drop when the height was three and one-half feet, but no beverage bottle ever survived the first drop when the height was four feet. Some of these beverage bottles were 6 oz., some 11 oz., and some 12 oz., and a grand total of well over fifty such bottles altogether were drop-tested from the four foot height in the course of the investigations reported by this paper.

The basic conditions of test were now set: drop the aerosol bottles from rest at a height of four feet to strike on the side of the bottles on the same concrete floor used for the beverage bottles.

If none of the 2 oz. pressure cologne bottles survive the first drop, all we can say from the experiment is that these bottles behave like beverage bottles when subjected to this particular, standardized drop test. If the test bottles consistently survive the first drop, we cannot necessarily say that they are "safer" than the control beverage bottles. But we should be able to say how likely it is that the average performance of the test bottles would differ from that of the beverage bottles by as much as observed if all that accounts for the observed difference is just "chance." If this likelihood is sufficiently small, we must either reject the contention that there is no real difference between the 2-oz. pressure cologne and beverage bottles under the conditions of test or admit that we have witnessed a miracle.

Thus we seek a measurable degree of certainty regarding the relative resistance-to-breakage of 2-oz. pressure cologne bottles and beverage bottles when both types of bottle are exposed to the particular hazard of the standardized drop test proposed.

But we seek more than this. We have two different bottle shapes. We want to compare not only the relative safety of these two shapes, but also the effects on safety of different temperatures and different degrees of fill. Aerosol bottles of whatever shape won't always be kept at just room temperature—some of them inadvertently may be kept near hot radiators. And they aren't going to stay full forever! What about relative safety of different bottle shapes at different temperatures at different levels of fill? How may one set up an experiment that will make valid comparisons between all these variables? How many bottles will be needed?

Figure 3

COURTESY LENTHERIC

COURTESY CARVEN PARFUMS

Figure 2

Fortunately, modern statistical science has made available a technique called "experimental design" which makes possible the *simultaneous* comparison of two or more experimental fctors at two or more "levels" for each factor, and to do so with marked economy in the amount of testing required. Forty little cologne bottles sacrificed their lives in one of these experimental designs at Zonite!

The Experimental Design Used

The philosophy of modern statistical science in the field of experimentation requires that the choice of the particular experimental design to be used be made in advance of the experiment so that the data to be collected can be taken in accordance with the requirements of the design. The design will depend on the objectives of the experiment, the number of variables involved, and the cost of experimental effort that can be tolerated.

In the case of the cologne bottles, the objective of the experiment was to assess the relative importance of pertinent factors believed to influence the resistance-to-breakage of the pressure cologne bottles under a standard drop test, and to discover, if possible, as a by-product, how these bottles, over all conditions of test, compared with the known behavior of beverage bottles under this same standard drop test. The "pertinent factors" selected were: (1) bottle shape; (2) environmental temperature; (3) amount of fill. These then became the "independent variables" of the experiment. They are referred to as "factors," or "main" effects.

Next, it was necessary to decide how many "levels"

(*Continued on page 792*)

NEW PERFECTION
DROPPING PARTS
meet EVERY
"Satisfaction Test"

QUALITY	A-1
UNIFORMITY	A-1
PERFORMANCE	A-1
CLEANLINESS	A-1
SERVICE	A-1

#1

Non-rolling, extra-depth, Bakelite cap; thick-flange rubber bulb; Saftee-ball glass.

#3

Regular plastic cap; thin flange rubber bulb; semi-blunt glass.

#4

Metal cap: AMEKINE oil-resisting synthetic rubber bulb; blunt glass.

They're A-1 with your customers, too . . . assuring you repeat sales!

When you sell a product that pleases and satisfies your customers, you're assuring yourself of their goodwill and continued patronage. New Perfection Dropping Parts help to give you that kind of a product. They are convenient, attractive, dependable—manufactured and assembled under careful and constant inspection to assure the highest possible quality.

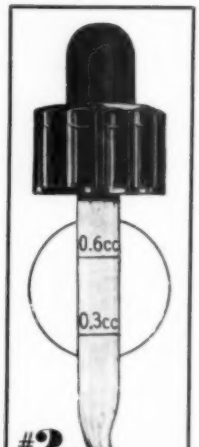
RUBBER BULBS are supplied in many styles and colors. Oil-resisting AMEKINE synthetic rubber is used for oil preparations; natural rubber is supplied for other products.

CAPS of plastic or metal can be furnished in a complete range of sizes and colors.

DROPPER GLASSES are available in a wide variety of styles and sizes; plain or CALIBRATED in any color to mark specific dosages.

• • • • •

We can make up dropping parts to fit your own bottles or we can supply bottles in an attractive modernistic style in Amber, Blue, Green, or Clear glass, complete with dropping parts, in the following sizes: 2 cc, 1/8, 1/4, 1/2, 1 and 2 oz.



#2

Non-rolling extra-depth Bakelite cap; thick flange rubber bulb; special bent glass. (Calibrated in color).

• • • • •

WRITE FOR SAMPLES AND QUOTATIONS

PENNSYLVANIA
GLASS PRODUCTS CO. INC.

"Glass Goods of the Better Kind"

430 N. CRAIG ST. • PITTSBURGH (13), PA., U.S.A.

Packaging and Selling

Book Review

The book which has undoubtedly had a highly preferred reader interest in this industry during the last month is a paper-covered pamphlet headed "Prospectus, Hazel Bishop, Inc., Common Stock."

There has been keen interest in this particular book by members of the trade who had no intention of investing their money in this particular business venture. The reason for this interest is a number of revealing flashes as to what has been happening and what may happen to this industry, in the tersely worded language of the down-town stock salesman.

As a description of what is happening to this industry because of the success of the mass-advertised specialty, which is attempting to carry the products of this industry down through every branch of distribution into the grocery store and the delicatessen, to transfer the industry's products from the field of fashion to that of everyday utility and to eventually force unit prices to a point acceptable to a mass market, is excellently expressed in the following paragraph from this pamphlet.

"The Company's basic policy has been to use extensive newspaper and television advertising and a relatively small sales force, and to limit its products to a few items in the color cosmetic field on which it can concentrate its advertising and sales efforts. On the other hand, rather than restricting sales outlets to franchised department stores and drug stores, the Company has achieved mass distribution through variety chains, drug wholesalers, independent and chain drug stores, and supermarkets, as well as through department stores and beauty shops. At present the Company's products are distributed through approximately 140,000 outlets in the United States."

As another insight into the future, as stated by the company which everyone must admit has been supremely successful in advertising, take the following: "The Company believes that the addition of color T V will substantially increase the effectiveness of its promotion of Hazel Bishop Color Cosmetics."

This seems to us a statement that is in the back of the mind of everyone in color cosmetics and that one of the resulting forces in this industry will be a major effort to readjust or streamline business to permit the use of television. The demonstrator behind the retail counter first built the cosmetic business. Avon Products, the industry's most successful cosmetic business and by far the world's largest cosmetic business, has proved the effectiveness of taking the demonstrator out from behind the retail counter and putting her in the home.

Color television offers the opportunity, for the man who can think up a suitable program, to put the demonstrator automatically and consistently into millions of homes.

Hazel Bishop estimates the current advertising expenditures of the company for the year, 1954, at $5,000,000. Sales in 1953 were $9,908,804 and for the first nine months of this year, $8,313,185.

Mean Competition

It ain't fair the way some retailers are acting in this new era of competition. For instance, when one leading super-market chain gave away many thousand coupons that were worth 25c each when redeemed for any of the foods bearing this super-market's own label, a competing super-market met this competition in a way that can only be called mean. This competing super-market posted a big sign stating that it would redeem all the other store's coupons at a value of 30c for anything in their store. An executive of this competitor stated "We filled bushel baskets of those people's coupons."

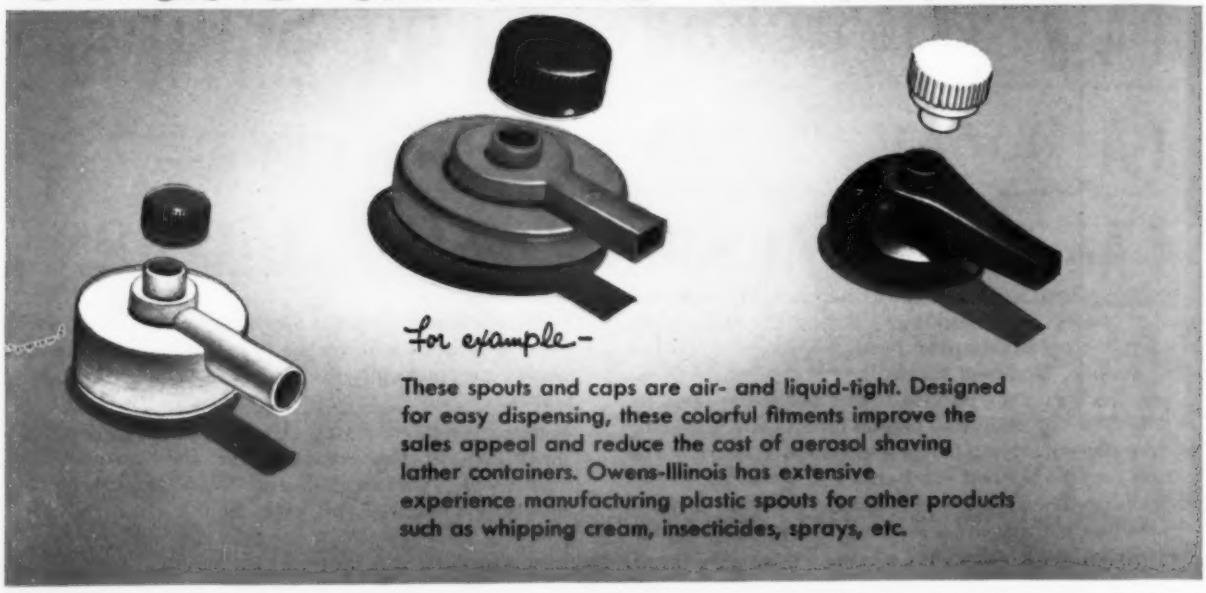
Another, mean, competitive situation bobbed up among Los Angeles discount houses. These discount houses have been making use of department store advertising to move large quantities of ready-to-wear. How this works out is that a discount house buyer follows a department store buyer into leading vendors. The discounter then attempts to purchase substantial quantities of anything ordered by the department store buyer that would indicate advertising would be used. Then when the department store advertising breaks, the discount house gets on the job with their publicity. One discount house has been posting department store advertising with the prices crossed out and their own much lower prices listed.

Pays to Advertise

In spite of all the investigations and the clamor about disappearing brand loyalty and the decreasing productive effect of advertising at the point of sale, apparently advertising still pays off in a solid substantial way. N. W. Ayer, a leading advertising agency set out to prove this in a test conducted in Lit Brothers, a Philadelphia department store over a 3-week period. During the first week, a nationally advertised brand of

For precision and versatility—choose

OWENS-ILLINOIS for PLASTICS

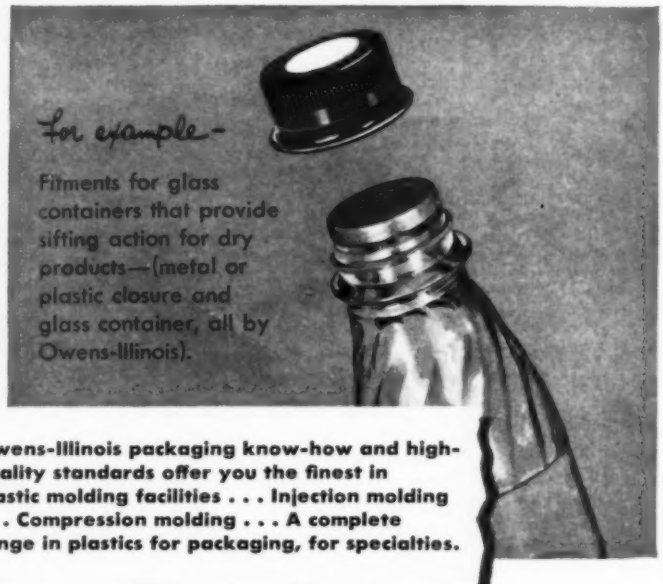


for example—

These spouts and caps are air- and liquid-tight. Designed for easy dispensing, these colorful fitments improve the sales appeal and reduce the cost of aerosol shaving lather containers. Owens-Illinois has extensive experience manufacturing plastic spouts for other products such as whipping cream, insecticides, sprays, etc.

for example—

This no-drip plastic fitment for liquid condiments simply slips on top of bottle. Plastic closure gives a positive, leak-proof reseal.



for example—

Fitments for glass containers that provide sifting action for dry products—(metal or plastic closure and glass container, all by Owens-Illinois).

Owens-Illinois packaging know-how and high-quality standards offer you the finest in plastic molding facilities . . . Injection molding . . . Compression molding . . . A complete range in plastics for packaging, for specialties.

Branch Offices:

Albany . . . . . New York	Columbus . . . . . Ohio	Memphis . . . . . Tennessee	Pittsburgh . . . . . Pennsylvania
Atlanta . . . . . Georgia	Dallas . . . . . Texas	Milwaukee . . . . . Wisconsin	Portland . . . . . Oregon
Baltimore . . . . . Maryland	Denver . . . . . Colorado	Nashville . . . . . Tennessee	Richmond . . . . . Virginia
Birmingham . . . . . Alabama	Detroit . . . . . Michigan	New Orleans . . . . . Louisiana	Rochester . . . . . New York
Boston . . . . . Massachusetts	Fresno . . . . . California	New York . . . . . New York	St. Louis . . . . . Missouri
Buffalo . . . . . New York	Houston . . . . . Texas	Oakland . . . . . California	St. Paul . . . . . Minnesota
Charleston . . . . . West Virginia	Indianapolis . . . . . Indiana	Oklahoma City . . . . . Oklahoma	Salt Lake City . . . . . Utah
Charlotte . . . . . North Carolina	Jacksonville . . . . . Florida	Omaha . . . . . Nebraska	San Francisco . . . . . California
Chicago . . . . . Illinois	Kansas City . . . . . Missouri	Peoria . . . . . Illinois	Seattle . . . . . Washington
Cincinnati . . . . . Ohio	Los Angeles . . . . . California	Philadelphia . . . . . Pennsylvania	Toledo . . . . . Ohio
Cleveland . . . . . Ohio	Louisville . . . . . Kentucky		

OWENS-ILLINOIS PLASTICS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO

jeans was sold against an identical quality jeans made by the same company but bearing an unknown label. The advertised brand outsold the unknown brand by eleven to one.

During the second week, the label was removed from the unknown brand and sales still further increased for the advertised brand.

The third week produced the convincing climax. During this sales period, the unlabeled jeans were reduced 10 per cent in price but were outsold by the advertised brand thirteen to one.

Lets Hope Not

We hope that by 1960 the doctors will still leave us a few things that we can enjoy. Also, marketing men take note, no matter what you make or sell, you may wake up some morning to find that the doctors have shot it full of holes.

In the last ten years, the medical profession has convinced a high percentage of the American public that a calorie is worse than a Communist and not a few million people, particularly women, would rather face a grisly bear than a strawberry shortcake.

Also during this period, a large number of people have been convinced that anything with salt in it is like a coiled cobra and another large group blanch when they hear the word "cholesterol," and wouldn't be seen at the same dining table with milk, butter or an egg.

During this year the cigarette industry has had its turn, with pretty wide industry repercussions. Just to make it more interesting for the tobacco industry, a European doctor comes up with clinical evidence that pipe and cigar smokers have a much higher incidence of mouth cancer than other smokers or non-smokers.

To keep the procession going, a Professor of Surgery in Oklahoma claims that the incidence of bleeding-type ulcer is increasing faster among women than men and he blames as one of the chief offenders the increased drinking of coffee. A combination of coffee and cigarette is particularly hazardous.

Just to show that nothing is sacred, a French surgeon claims there is an active link between cancer and sex activity.

Bigger, Better Markets

In the twenty-five years from 1950 to 1975, the number of people over 65 will increase 70 per cent. Those between the ages of 25 and 45 will increase 17 per cent. Teenagers, that is between 14 and 19 years of age will increase by 77 per cent.

These future market figures were given by Ewan Clague, Special Assistant to the Secretary of Labor and former Director of the Bureau of Labor Statistics.

Bureaucracy

People in this industry ought to be glad that they are not in the liquor business, specifically because of the strange things bureaucracy can do.

The Bureau of Internal Revenue has just given the distilled spirits industry permission to spend as much as $30.00 for display materials which are rendered, loaned or sold to retailers. Previously, this material was held to a legal $10.00 for display material per retailer. But the bureau has finally bent to complaints that $10.00 was not enough.

The Internal Revenue Bureau has the authority under the Federal Alcohol Administration Act to determine the kind of promotional assistance distillers can give retailers. The Bureau has this authority because government believes it is necessary to guard against commercial bribery which would enable one firm to obtain more favorable treatment from dealers than its competitors receive.

Compelling Motivation

According to Dr. Ernest Dichter, the motivation expert, the way to sell shoes is to unsell the customer on their old shoes.

You don't have to be an expert to expound this statement. American prosperity is founded on our success in continually creating a feeling of dissatisfaction with what we possess. Obsolescence, the key word to American industrial activity, really means recurring dissatisfaction.

New Census

Early in 1955, manufacturers will get the new forms for the new census of manufacturers. Approximately 2,500,000 copies of this form will be distributed by mail.

More Work for Drugs

Maybe a new market is opening up for the pharmaceutical industry. Architects and builders please note that we are at your service.

This idea all stems from an accident that happened to Notre Dame in Paris. One of the famous gargoyles of Notre Dame crashed into the street causing quite a bit of excitement. The cause of this accident was diagnosed as the work of a microbe which has been making the stone work of this famous cathedral develop "sores" which eventually "burst" leaving the stone yellow and powdered beneath the sore.

The microbe causing all this trouble has been identified and a series of injections are now being employed.

Factory Visitors

How many companies in this industry would dare to establish a public relations program of inviting visitors to their factories? The answer probably is tragically few. There have been some beautiful as well as efficient factories built in this industry during the last ten years that lend themselves to such a public relations program. At least two companies in this industry have such a program. We understand that Upjohn invites stockholders, employees and their families, community leaders and particularly doctors, pharmacists, nurses, dentists, veternarians, etc., to visit their plant. According to a recent report, Upjohn entertained last year over 8,000 visitors which included 1,000 professional visitors. The cost of this program is said to have

been $50,000 a year. Photographs of professional groups are taken and sent later to each visitor and package samples are given with each visit.
Last year, Lederle is said to have had 10,000 visitors and to be running this year at the rate of 8,000 for the first six months. Lederle provides a shuttle train for the visitors to view in comfort the operations over the rather wide area occupied by this plant.
Reports are that there has been no interruption to the work, it helps employee morale, the employees like it and that it is worth the cost.

Price Isn't All

Less emphasis on price and more emphasis on good selling methods is the proper way to meet discount-house competition. This sounds obvious until we listen to a marketing expert who made a survey of a music retailer's selling practices. Said this expert, "Instead of selling music and entertainment, they sell price. I asked the salesman the difference between two television sets and was told it was $20.00."

Super-Duper

Katz Drug Company, Kansas City, has been giving the retail drug trade a super-duper lesson in what is possible for a drug store development.
The new Katz Drug Store in Memphis, Tennessee, has 35,200 square feet of floor space, stocks 31,000 different items and has 35 departments including sporting goods, electrical goods and men's furnishings.

Your Worth

One of the top companies in electronic or automaton research states that the average human being is capable of as many controlled reactions as a servo mechanism that would cost $1.5 billion.

Polyethylene for Chemicals

Polyethylene generally is resistant to deterioration and permeability when corrosive chemicals are stored in polyethylene containers for a relatively long period of time. This is a report by Jules Pinsky, Chief Physicist of the Plax Corporation. This makes interesting reading for any one who may want to use polyethylene for chemical ware, chemical storage, drum liners or piping, etc. Reports of this evaluation program were carried out by the Air Force and Plax and will be soon published by the Department of Commerce.
According to Mr. Pinsky 80 chemicals packaged in polyethylene bottles for time intervals as long as one year and at temperatures which reach as high in some cases as 165 degrees Farenheit showed no noticeable attack in chemical or physical corrosion or impermeability in 97 per cent of the cases.
Of the 80 materials tested only concentrated nitric acid attacked at room temperature.
Included in the chemicals tested were organic and inorganic acids, ethers, alcohols, ketones, terpa aromatic hydrocarbons and alkalis.

Cosmetic Growth

Merle Norman Cosmetics of Los Angeles is getting under way with the first national advertising campaign in the history of this company. Previously, this company has used only local newspapers and spot radio. Merle Norman operates through independently-owned studios around the country, which are now said to number over 1,000.

Of Good Survey

The Good Housekeeping Consumer Panel Report on Beauty Secrets for 1954 has just been issued.
This detailed panel study is a valuable addition to cosmetic statistics.
Since the 1952 panel, this study in 1954 shows an increase in the use of solid cologne from 27 per cent to 42 per cent, in liquid powder lotion 22 per cent to 32 per cent, in pressed powder from 11 to 32 per cent and liquid cleansing cream from zero to 16 per cent.

Package Pointers

A visiting group of Austrian businessmen recently received a bucket full of advice about packaging. Some of this advice was so good that quite a bit of it should spill over for the information of American businessmen. This meeting with the Austrian businessmen was one of the special meetings arranged with the cooperation of the Foreign Operations Administration and the Department of Commerce and the Package Designers Council.
Gerald Stahl, Vice President of the Package Designers Council, described the package designer as the spark which sets off new selling concepts and marketing techniques. It might be added here that nothing could be more true, in the cosmetic part of our industry particularly, where a new and original package has often sparked a great cosmetic or fragrance success.
Robert I. Goldberg, chairman of P. D. C.'s Education Committee, told the visitors that fundamentally the package must serve as (1) a transfer agent, (2) a protector, (3) a convenience for the retailer and (4) a convenience for the consumer.
Mr. Goldberg listed several points which must be considered in packaging a product.

1. Consumer needs.
2. Purpose of the products—a new product or a changed product?
3. What is its primary appeal?
4. Has it a secondary appeal or use?
5. What is the general consumer habit in respect to the product?
6. What is the selling area?
7. What are the selling methods of the retail outlets?
8. What are the general design trends?
9. What are the design trends in the total industry?
10. What will be the advertising requirements?

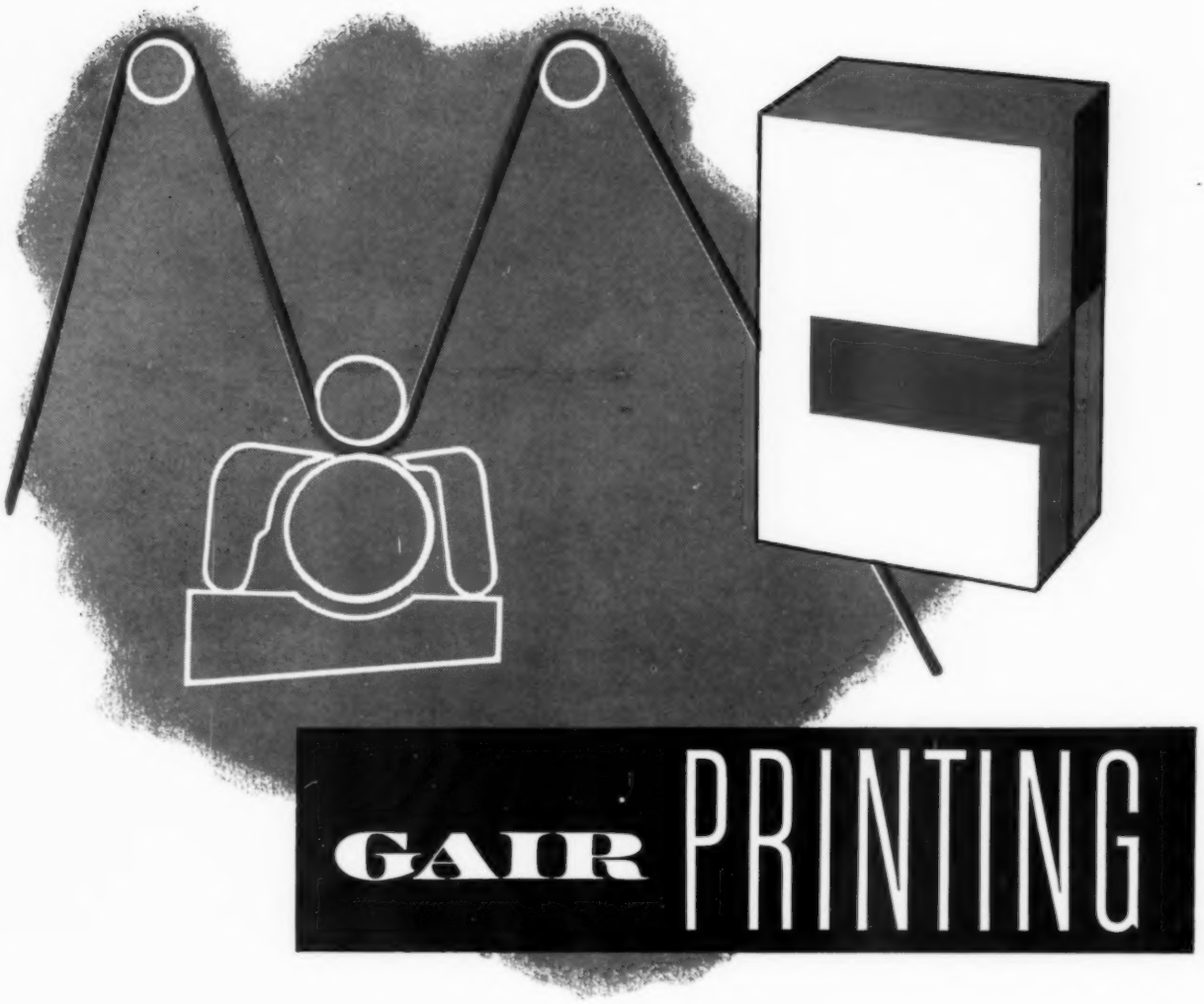
Allen Berni who was Chairman of the P.D.C. Awards Committee told these Austrian business men that package designing has now become a separate and a full industry. It was not long ago he said that package designs were left up to the packaging materials suppliers who for obvious reasons, had to stay pretty well within

Christmas Joy and New Year Happiness

THE HAZEL-ATLAS GLASS COMPANY

PLASTI-PAK
MODERN PACKAGING
FOR
DROPPER ASSEMBLIES
The Plastic Assembled Products Company has made another significant advance in dropper assemblies with its PLASTI-PAK. Fully automatic, high speed equipment enables us to wrap dropper assemblies in cellophane or pliofilm to your exact specifications at moderate cost. If desired, a printed message may be placed on the wrapping. For full information about PLASTI-PAK or the solution to any of your closure problems, write or wire today.
World's Largest Manufacturer of Dropper Fitments.
PAPCO
PLASTIC ASSEMBLED PRODUCTS CO.
1149 Watson St. - Baltimore, Md.

What makes a carton better?



GAIR PRINTING

one of the features of Gair's coordinated packaging service

The best graphic design in the world won't help a carton much in today's market unless it's faithfully reproduced in printing — not just once, but run after run. And here's why Gair printing will do just that.

Gair printers specialize in carton printing. They have the finest equipment money can buy — including letterpress, flexographic, sheet-fed and rotogravure presses. Gair paperboard, made in our own plant, is always uniform. And our control over the entire process of carton making assures that *your* carton materials, graphic design and printing process are perfectly blended.

Ask your Gair representative to see a sample of the gravure-printed carton that took first prize in the 1954 Folding Paper Box Association competition. He'll also show you how Gair structural design, graphic design, carton production from a variety of materials and expert help in mechanical packaging combine with Gair printing to give you a better package. Ask him for a copy of *Cartons by Gair*. Or write Department 73 FC.4.4

GAIR

FOLDING CARTONS

SHIPPING CONTAINERS • PAPERBOARD

ROBERT GAIR COMPANY, INC. • 155 EAST 44TH STREET • NEW YORK 17

Our number 431 line of flint glass machine made bottles contains
a full range of sizes from 1 dram to 16 ounces. They can be
supplied clear or frosted and either undecorated or
with your own fired-on ceramic label.
CARR-LOWREY
GLASS CO.
Designers and manufacturers of fine glass containers
Factory and Main Office: BALTIMORE 3, MD. • New York Office: 40 W. FORTIETH ST. • Chicago Office: 1572 MERCHANDISE MART

Package Doin's . . .

Folding-Carton Display

Dorothy Gray, Ltd. is presenting its dry skin special offer of Quick Cleanser Cream and Satura Moisture Cream in a unique folding-carton display designed and made by Robert Gair Co. This permits two items of different size and shape to be combined in a single counter display, affording wide visibility of the two items, yet providing display areas for the printed messages.

Special Aerosol Container

Sunex division of the Sun Tube Corp., Hillside, N. J., has designed an aerosol container especially for those manufacturers who want a "high fashion," cosmetic look in their products. The new 2¼-ounce container can be lithographed in up to three colors in a base coat, or it may be gold-lacquered with silk-screen imprint.

The seamless aluminum container may be either pressure- or refrigeration-filled and has satin-finished shoulders and a non-corrosive nylon valve. The protective dome is made of either polystyrene or polyethylene in any color desired.

H&D Packaging "Idea Book"

Hinde & Dauch has published the latest edition of "How to Pack It," a complete packaging portfolio which describes and illustrates a unique selection of 12 different styles, and more than 70 types, of corrugated boxes for a variety of products. Among the boxes included in the booklet are shelf and counter, display, luggage style, "prepaks," Duplex (combination shipping and display) and a new "Hevi-Duty" box for high-density products.

New Shipper-Displays

Bristol-Myers Co. recently introduced a new pair of shipper-displays to promote special tooth paste-toothbrush combination offers. Designed by Hinde & Dauch, the units—one slightly smaller than the other—act as both shipping boxes and displays for Ipana Tooth Paste and Tek Toothbrush products.

Plastic Ribbon-Ties

Rapid Ribbon Corp., Croton-on-Hudson, N. Y., has devised ready-made ribbon-ties of Krene (Bakelite Co. trademark) plastic to snap around handsome gift packages in a matter of seconds. Although stretched considerably when wrapped around a package, the ribbon returns to its original size and shape.

Aerosol Packaging Winners

Three toiletry packages won honors in the third annual aerosol packaging contest, sponsored by the Chemical Specialties Manufacturers Association, on December 7, at the Hotel New Yorker.

Lilly Dache Invisible Net hair spray, product of General Beauty Products, Inc., not only won first place in the hair preparations class but was judged the top package among 282 entries in the national contest.

The two other winners in this field were Yardley Shaving Foam (Yardley of London, Inc.) and Parfum Corday (Parfums Corday, Inc.).

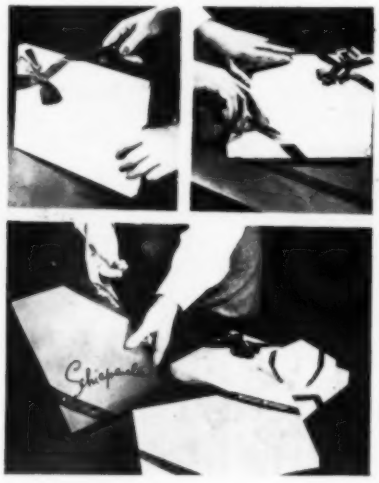
Bristol-Myers Shipper Display

Hinde & Dauch Packaging Book

Sun Tube Aerosol Container

Dorothy Gray Folding Carton

Plastic Ribbon-Ties



MANY Styles AND Sizes

...THERE'S AN ANCHOR CAP FOR EVERY SEALING PURPOSE

ANCHOR HOCKING makes eight stlyes of metal and molded, screw and lug caps for medicinal and health products, toiletries, cosmetics and household chemicals. Each is designed for specific sealing purposes—all provide dependable, economical, attractive and efficient seals.

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the perfect safety of unbreakability . . .
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The Plaxpak polyethylene bottle is packed with merchandising magic. And Plax alone has the experience to exploit this magic to its fullest in behalf of your product. Our packaging staff is at your service –
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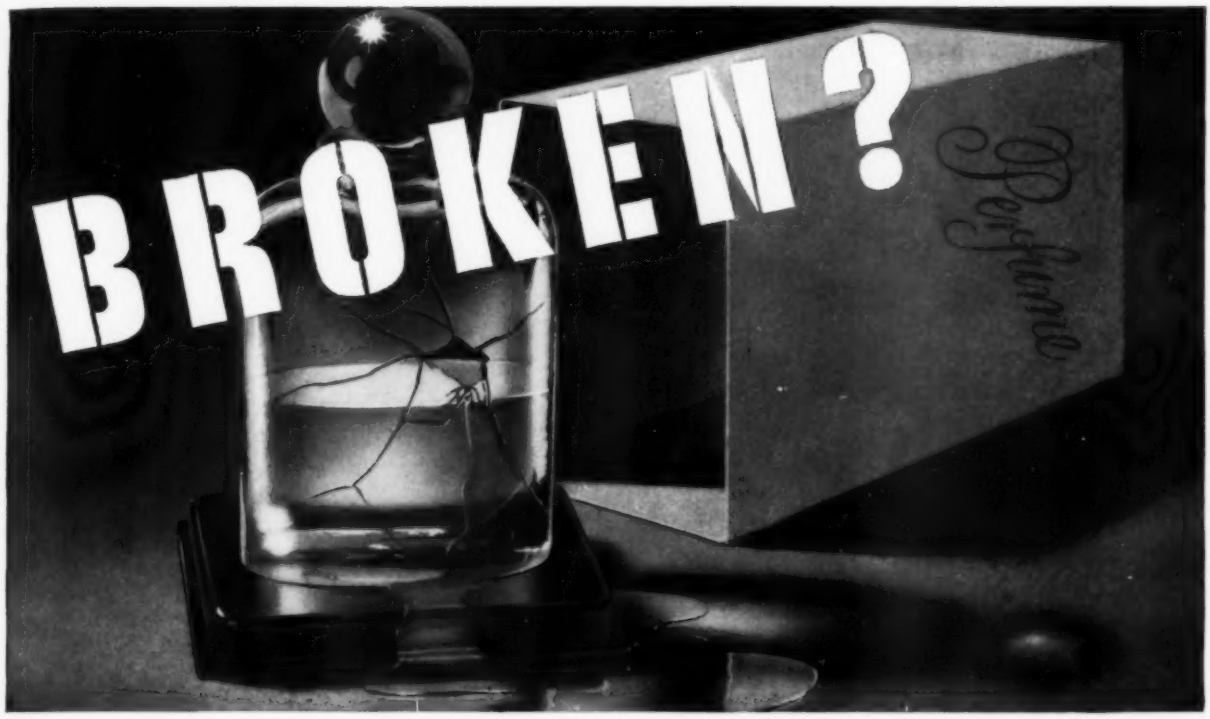

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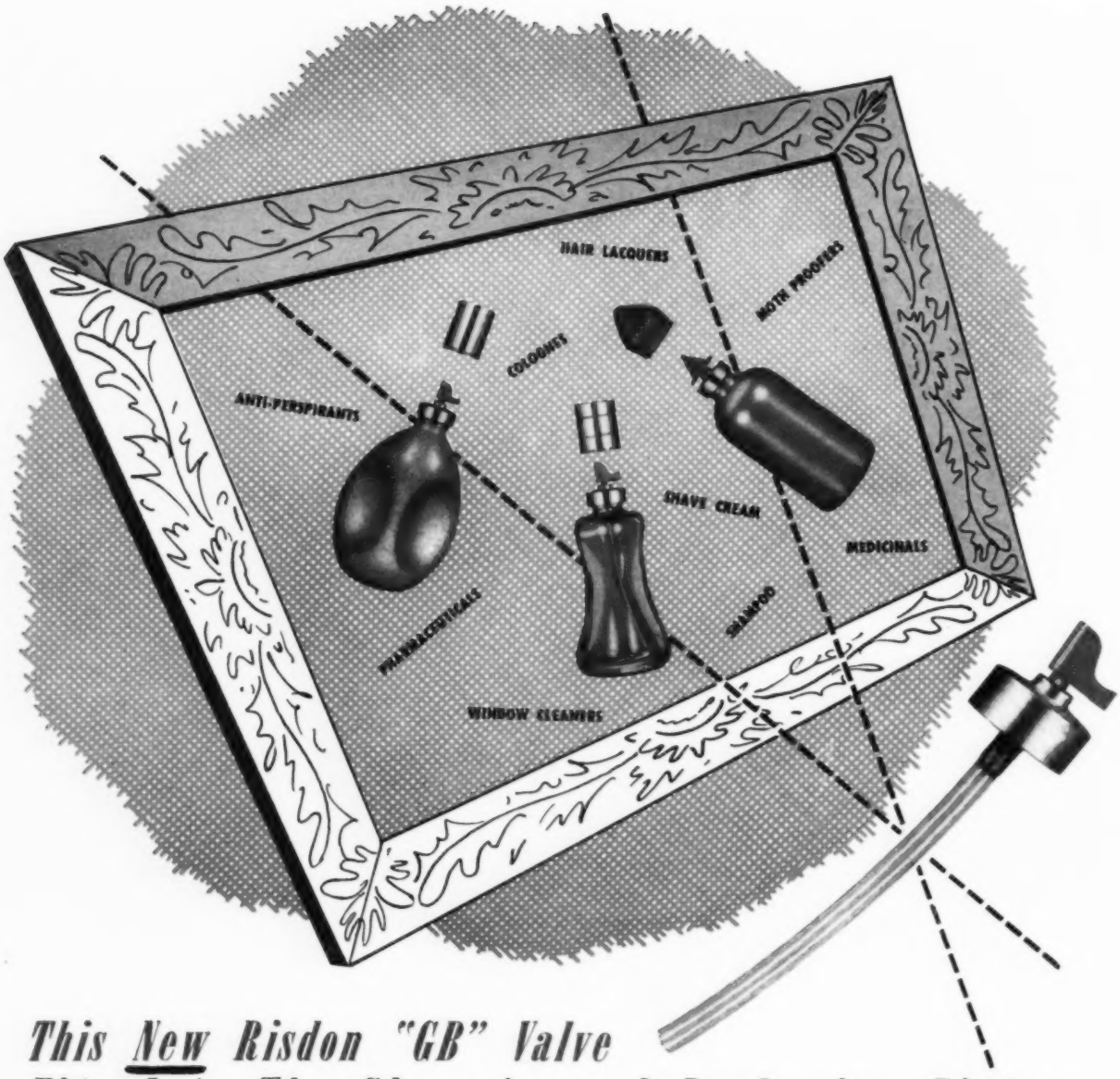

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Produces a soft spray cloud of uniformly minute particles. Modified models can be supplied to give larger particle size, when required. Positive cut off.

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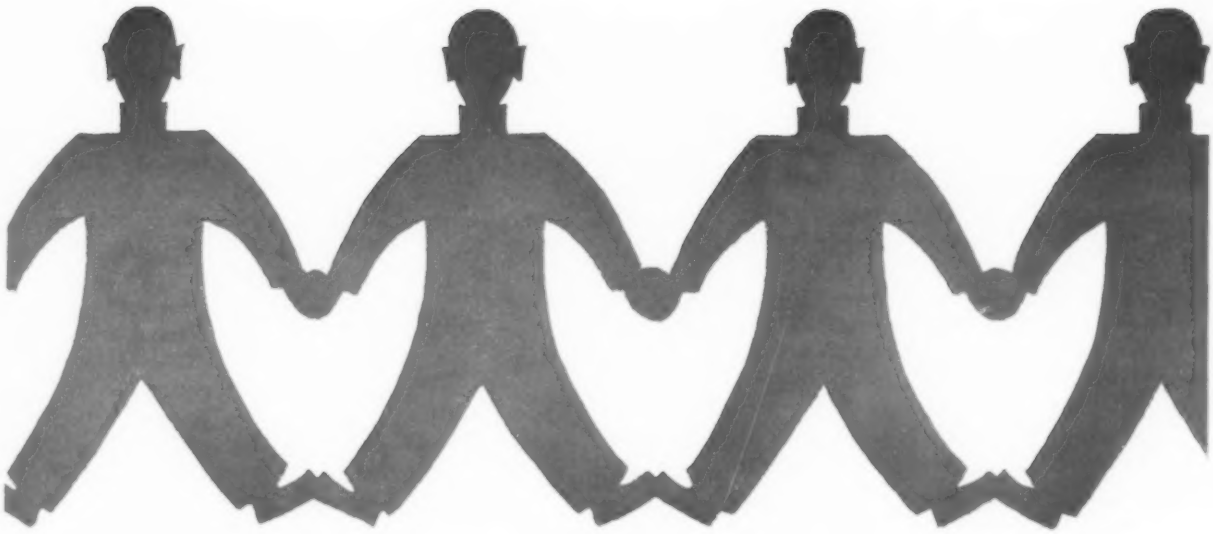

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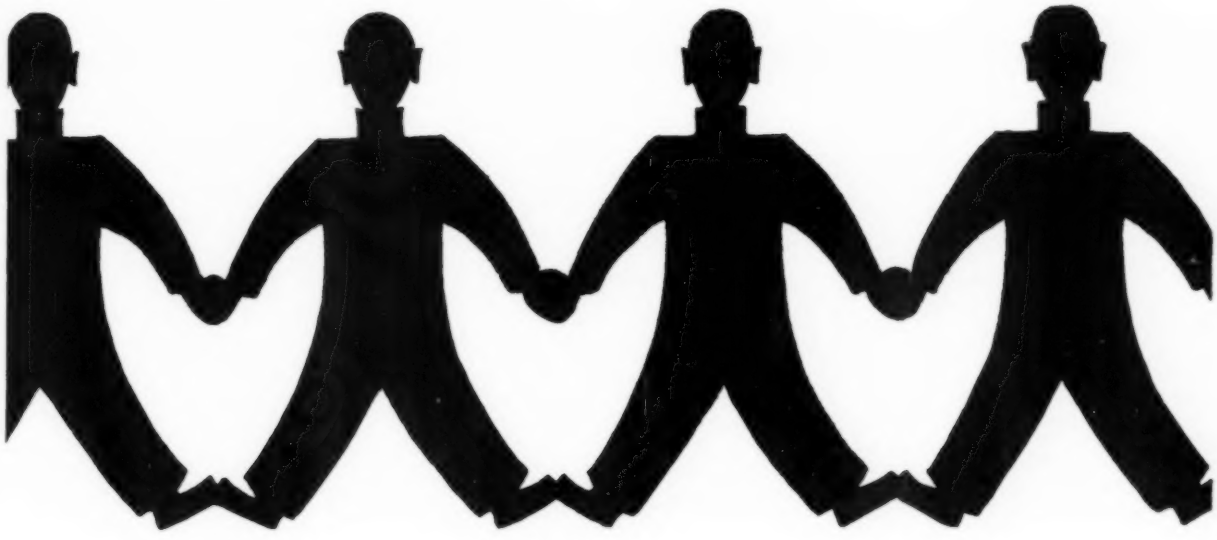

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FORTY LITTLE BOTTLES AND HOW THEY FELL

(*Continued from page 775*)

of each variable would be used. Bottle shape was easy; at the time the experiment was planned there were two shapes—"round" and "oval"—so factor (1) had two levels. It was then decided that sufficient discrimination could be obtained by using two levels for each of the other two factors, viz. 70° F. and 130° F. for temperature; "full" and "1/3 full" for amount of fill.

Finally, a decision was needed as to the amount of "replication" to be built into the design, viz. for each set of test conditions, how many bottles should be tested? When no prior data bearing on the experiment are available, this decision has to be purely arbitrary. In any event, the decision may have to be made in terms of cost consideration.

In the case of the cologne bottles, there was some information available by virtue of preliminary drop tests that had been made with the round aerosol bottles prior to the proposed formal experiments in question here. Admittedly, these earlier data were scanty and inadequate for accurate estimation purposes, but they did give a reference frame that was at least not a sheer guess. On the basis of this information, and taking into consideration cost of further drop tests, it was decided that five bottles per set of test conditions would give acceptable discrimination. Actually, it was estimated that with this amount of testing, a difference of five or more drops between any two comparisons to be made by the experiment would indicate a real difference between the two factors being compared with a risk of about five per cent, i.e., in about five per cent of such experiments a real difference may be claimed by the experiment when, in fact, none exists.

The experiment now had a blue-print. This blue-print—or "design"—is what is known as a 2x2x2 factorial design. In addition to its simplicity, it has the unique advantage that the conclusions it delivers about the comparisons involved can be pictured graphically. For the drop-test experiment on the cologne bottles the design is as shown in Fig. 4.

	ROUND		OVAL	
	Full	1/3 Full	Full	1/3 Full
	—(1)	—(3)	—(5)	—(7)
	—	—	—	—
70° F.	—	—	—	—
	—	—	—	—
	—	—	—	—
	—(2)	—(4)	—(6)	—(8)
	—	—	—	—
130° F.	—	—	—	—
	—	—	—	—
	—	—	—	—

Figure 4
Design for 2x2x2 Factorial Experiment with Cologne Bottles

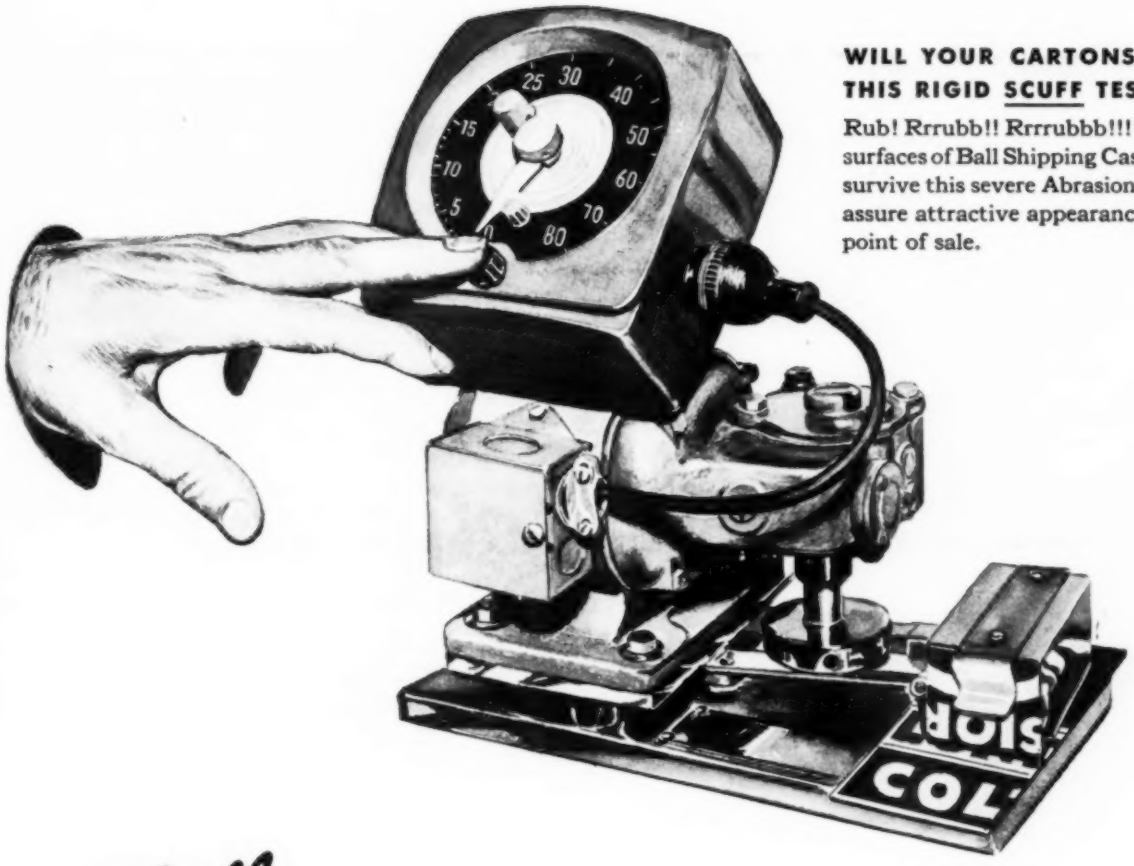
The design calls for a random sample of 20 of the round bottles and 20 of the oval bottles. These samples were obtained from finished stock—filled, pressurized and ready for shipment. Ten of the round bottles were exhausted to one-third of the initial contents, and ten of the oval bottles were similarly treated. The order of carrying out the tests called for by the design is sometimes of importance. In this experiment, however, it was felt that no bias would be introduced into the results by failure to randomize the order of testing. Consequently, each block of five tests was run through as a unit until the five observations could be reported for that block. Choice of block was at the discretion of the laboratory and followed no set pattern, as the complete experiment extended over several weeks, and blocks were chosen and run at the convenience of the laboratory on different days.

The dependent variable in this experiment is the number of drops survived by the bottle before breakage. The test result recorded is the drop number at which a bottle broke. The universe to be evaluated by this experiment is the universe of 2-oz. frosted and screened round and oval cologne bottles that survive without leakage or breakage at most 49 drops under standard test conditions. Consequently, a bottle that survived 50 drops was excluded from the test data and replaced by a bottle of the same type that did not survive 50 drops. Likewise, a bottle that developed leakage without breakage in the course of the test was excluded from the test and replaced by a bottle of the same type that did not develop leakage before breakage. Leakage biases the test in favor of greater "safety," as it reduces internal pressure. The upper limit of 50 was frankly arbitrary—the experiment was not aimed at developing a distribution of bottle strength, but only at making comparisons within a clearly defined subset of this distribution. The restriction-to-50 convention does expose the experiment to the introduction of some bias, but the bias is all in the conservative direction, affecting only the nature of the universe being evaluated.

Referring to Figure 4, the entries in any cell give an estimate of the average and dispersion in critical drops for the particular conditions specified. For example, the entries in cell (1) can be used to provide estimates of the average and dispersion of critical drops for round bottles that are full and are dropped at 70° F. To compare the effects of shape on breakage, we would use all the data in cells (1)-(4) vs. all that in cells (5)-(8), thus comparing round with oval effects over all other conditions of test. Similarly, to compare the effects of temperature on breakage, we would use all the data in the 70° row of the table vs. all that in the 130° F. row, thus comparing 70° with 130° F. temperature effects over all other conditions of test. Finally, to compare the effects of fill on breakage, we would use all the data in cells (1), (2), (5) and (6) vs. all that in cells (3), (4), (7), and (8), thus comparing full with 1/3 full effects over all other conditions of test.

The statistics used are the average and "standard

(*Continued on page 794*)



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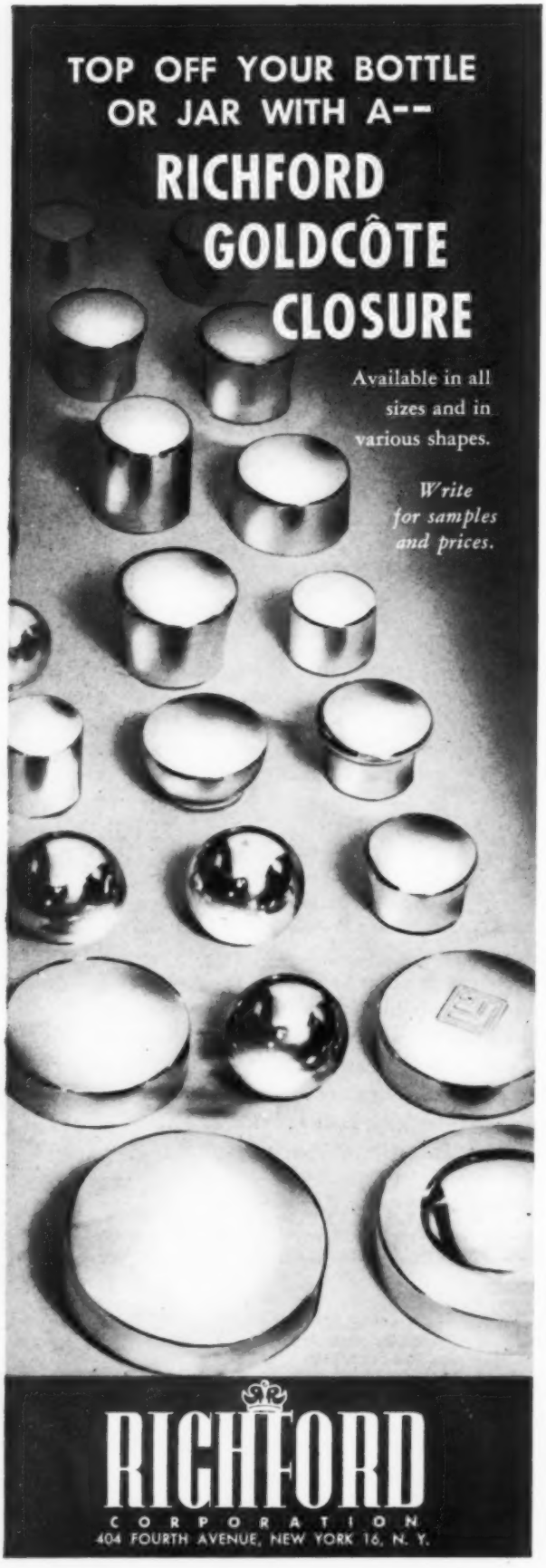

(Continued from page 792)

deviation" of the five observations recorded in each cell. Average needs no explanation—it is a familiar concept. If we use the symbol X for a single observed value, then the average of a sample of N values of X will be represented by $\overline{X}$, read "X-bar." For the purpose of this report, it must suffice to say that standard deviation is a sort of preferred yardstick in statistical analysis used to give a measure of this dispersion of the X values about their average value $\overline{X}$. A small standard deviation implies that the data it came from tend to be concentrated near the mean. The symbol for standard deviation is σ_x, read "sigma-sub-X."

Presentation and Analysis of the Data

Figure 5 presents the observed results, together with the respective means and standard deviations. For convenience, the values of X^2 are also recorded. The formula used for standard deviation is:

$$\sigma_x = \frac{\sqrt{5(\text{Sum of } X^2) - (\text{Sum of } X)^2}}{5}$$

The grand average for the entire set of 40 observations is 11.98, and the average of the eight standard deviations is $\overline{\sigma_x} = 7.85$. Each of these values is inflated by the one bottle in cell eight that broke on the 50th drop. When the mean and standard deviation of the remaining four observations in cell eight are calculated, the X = 50 value is more than six of these standard deviation units above the mean of the remaining four observations. Even with so small a sample size, this

	ROUND				OVAL			
	Full (1)		1/3 Full (3)		Full (5)		1/3 Full (7)	
	X	X^2	X	X^2	X	X^2	X	X^2
	7	49	7	49	11	121	32	1024
	6	36	39	1521	1	1	20	400
70°	10	100	36	1296	11	121	27	729
	2	4	9	81	2	4	11	121
	4	16	9	81	24	576	16	256
	29	205	100	3028	49	823	106	2530
	$\overline{X}$	σ_x	$\overline{X}$	σ_x	$\overline{X}$	σ_x	$\overline{X}$	σ_x
	5.80	2.71	20.00	14.34	9.80	8.28	21.20	7.72
	(2)		(4)		(6)		(8)	
	X	X^2	X	X^2	X	X^2	X	X^2
	7	49	10	100	15	225	50	2500
	2	4	8	64	11	121	5	25
130°	12	144	3	9	2	4	3	9
	2	4	5	25	1	1	9	81
	7	49	12	144	12	144	19	361
	30	250	38	342	41	495	86	2976
	$\overline{X}$	σ_x	$\overline{X}$	σ_x	$\overline{X}$	σ_x	$\overline{X}$	σ_x
	6.00	3.74	7.60	3.26	8.20	5.64	17.20	17.30

Figure 5—Data and Pertinent Statistics for Drop-Test Experiment with Cologne Bottles.

is an extremely unlikely event if we assume that this particular bottle belongs to the same family as the other four bottles in this part of the experiment. Consequently, it is not reasonable to regard this one bottle as a "freak." Nevertheless, this observation did occur, freak or no freak, so its test result is retained in the analysis.

(Continued on page 850)

HOW *glass aerosol* CAN BOOST THE *sales appeal* OF *your products*

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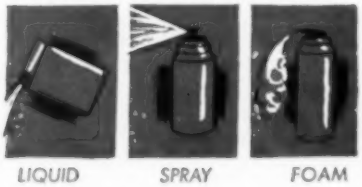
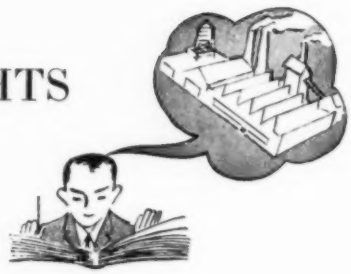


LIQUID SPRAY FOAM

Patent THOUGHTS AND TRENDS

*by Thomas Cifelli, Jr.**

PATENT ATTORNEY



Highlights This Month

1. Recent holdings of the U. S. Patent Office Board of Appeals to the effect that:

(a) An article is now considered a *prior art reference* as of the date the *article is submitted* to the editor of a publication;

(b) *Strict proof* is required of the efficacy of proposed *treatments* for the human body; and

(c) there is nothing in patent law which categorically excludes methods of *treating the human* body from patent protection.

2. Recent patents covering stabilized *selenium disulfide therapeutic shampoos* and *soaps* having *anti-bacterial* properties.

Published Article Is Prior Art when It Is Submitted to Editor

It is rather generally known that in the U. S. A. a patent application can be defeated if the Examiner can cite a printed article or patent showing the claimed invention and having an effective date more than one year prior to the date of the filing of the patent application. It is perhaps not quite so generally known that if the effective date of the reference is less than one year prior to the filing date of the patent application, the Examiner can nevertheless cite the reference and it then is encumbent upon the patent applicant to show that he made the invention prior to the effective date of the reference. Just what evidence is sufficient is not our present concern. Until rather recently, it was taken for granted that the effective date of the article was its publication date. As for the effective date of a cited patent, it depends on the country of issue. In the case of U. S. patents the effective date as a reference is its filing date.

Insofar as cited patents are concerned, no change has been made in the rule just stated. However, a veritable Pandora's box of controversy seems to be brewing because of some recent holdings which take the position that the date the article is received by the editor, and not the date of publication, is the effective date of the reference. This holding is based on the view that when an article is submitted to the editor of a publication, it immediately becomes known by others and the patent statute provides that no patent can be granted where the invention was known or used by others in the U. S. A. prior to the date of invention.

All of this may seem rather technical but the impact of this holding on the chemical industry is believed to be very great. All one needs to do is to consider the large number of pages being turned out by the printing presses devoted to the publication of chemical matters. Since the editors of the chemical journals do not seem to lack material to publish, it very often happens that there is a time lag of several months between the date an article is received by the editor and the date the article is actually published. Consequently, it is very likely that many patent applicants will lose out because while they may be able to show that they made their invention prior to the publication date of the article, they nevertheless may not be able to go back an additional several months and show that they made their invention prior to the date that the article was submitted to the editor. Indeed, in the case of one of the holdings, involving an application of Dr. Theimer of van Ameringen-Haebler, the spread between the two dates was 15 months.

In view of these recent holdings it is believed entirely unnecessary to caution patent applicants to check carefully the date a reference has been received by a U. S. publisher.

The question we now raise as a result of the recent holdings is whether they are in the public or scientific interest or not. As on all questions there are two sides to it. It does seem to the writer that the question goes beyond mere patent considerations and is one in which technical people and their organizations should be interested. In this connection, some of the old readers may recall that back in November of 1951 a suggestion was made in these columns for a more active technical participation in patent practice. Nothing however ever came of that suggestion, at least to the knowledge of the writer.

It will be of interest to note here that the Patent Bar has recently decided to take a position on this question and the chemical practice committees of some of the Patent Law Associations are studying the matter carefully. While this is to be commended, it is really the battle of the technical people as well.

Showing of Efficacy Required in Cases of Treatments

It has been some years now that the Patent Office has been increasingly critical in its requirements before it will issue a patent dealing with a treatment for the human body. These rigid requirements stem perhaps from a sensitiveness on the part of the Patent Office to unfavorable publicity relating to some patents that were issued in the past and also from the unfortunate consequences of the "elixir of sulfanilamide" cases in the middle 1930's.

In a recent case, Ex parte *Kesel* 103 U. S. P. Q. 103, the Patent Office Board of Appeals reiterated its rule that in cases relating to the treatment of the human body, strict proof is required of the efficacy of proposed treatment. No patent can be granted upon the mere supposition or theory that a certain remedy will cure a certain malady.

Nevertheless, it is interesting to note that in the particular case under consideration the Board held that a proper

*Newark, New Jersey.

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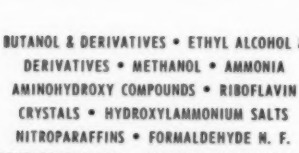
Melting Point, °C	30 to 31
Boiling Point, °C	165 at 760mm
Specific Gravity	0.934 at 20/20°C
pH at 20°C of 0.1M Solution	11.3
Vapor Pressure at 20°C	approx. 1mm
Flash Point (Tag. open cup)	159°F
Solubility in Water g/100 ml at 20°C	completely miscible



BUTANOL & DERIVATIVES • ETHYL ALCOHOL & DERIVATIVES • METHANOL • AMMONIA AMINOHYDROXY COMPOUNDS • RIBOFLAVIN CRYSTALS • HYDROXYLAMMONIUM SALTS NITROPARAFFINS • FORMALDEHYDE N. F. PENTAERYTHRITOL • ACETONE METHYLAMINES

COMMERCIAL SOLVENTS
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showing of utility had been made. The composition involved in the case was an ordinary dentifrice to which had been added a non-toxic salt of ammonia. The patent application originally stated that the invention dealt with a method of preventing dental caries, but after the Examiner had rejected it on the ground of lack of utility the application was amended by stating that the invention related to a dentifrice for reducing lactobacillus bacteria in the mouth.

Evidence was offered to the effect that the bacteria count was reduced but the Examiner nevertheless held that since it had not been definitely established that the bacteria causes dental caries, the mere reduction of bacteria in the mouth has no utility.

The Board pointed out that there was nothing in the case to indicate that the addition of the salt destroyed the utility of the dentifrice as such and consequently held that the composition retained its utility as a dentifrice if nothing else. The actual holding was to the effect that since the claim covered a known composition of recognized utility and although the new ingredient did not enhance the properties of the old composition, neither did it destroy the recognized utility. Consequently, as long as the composition was capable of acting as a dentifrice it had *utility*. The Board, however, sustained the rejection on the ground that there was nothing patentable over the prior art.

Method of Treating the Human Body Can Be Patented

The basic question involved in a recent landmark case, Ex parte *Scherer*, 103 U. S. P. Q. 107, was whether methods in which the human body was treated, the object of the method being some medical or surgical purpose, are within the field of subject matter capable of being patented.

In view of the probable importance of the question, the Commissioner of Patents convened an 11-man board to hear the matter. The usual board consists of only three members.

Ever since the well-known *Morton* v. *N. Y. Eye and Ear Infirmary* case, dealing with the use of ether in connection with surgical operations, it had been supposed by many that all methods involving the treatment of the human body were unpatentable. The Patent Office had generally followed this rule, the leading case there involving a method of treating piles which consisted in manipulative steps including injecting an unspecified medicament.

The enlarged Board, by a tally of 10 to one, held that it cannot be categorically stated that all methods for treating the human body are unpatentable. Indeed, the Board pointed out that claims involving treatment of the human body have been allowed before by the Patent Office Board of Appeals.

The method involved in the case is clear from the following claim:

> The method of injecting fluids into the human body comprising the steps of placing a container of an injecting instrument having a jet orifice tightly against the epidermis to provide a hydraulic seal between the edge of the orifice and the epidermis, displacing liquid from the container through the jet orifice at a pressure sufficiently high to produce a jet velocity which causes the jet to puncture the epidermis and penetrate the body tissues therebeneath, including the steps of continuing the high pressure acting on the jet until it has reached a desired depth, and abruptly stopping the high pressure and thereafter continuing the jet at a lower pressure after the high pressure has been exerted and until the liquid has been dispersed at such desired depth.

The Board felt that the method recited a series of manipulative steps performed outside the body, including the step of placing the jet orifice against the epidermis to provide a hydraulic seal between the edge of the orifice and the epidermis with the body acting as a passive member without any reference to the nature of the liquid injected or to any reaction of the body to the liquid. The Board felt that the advance resided in the manipulative steps performed outside of the body.

There was a strong dissenting opinion, which stated that the process should realistically be considered in the situation where it is actually used and not as a disembodied series of steps apart from the human body. It was further stated in the dissent that to consider the process as merely involving steps of transferring a liquid from one position to another is to consider the claimed process no more than a useless activity.

It may well be that the impact of this decision will be a spur of far-reaching importance to inventions in the medical field.

Skin- and Scalp-Treating Compositions

Baldwin and Young, two Abbott inventors, recently received a patent for stabilized selenium disulfide therapeutic shampoos. It seems that although selenium disulfide had been known as a potential therapeutic and fungicidal agent, formulations containing this material were adversely affected on storage or exposure to elevated temperatures and light.

The two Abbott inventors claim that aqueous suspensions of selenium disulfide which are kept acidic and into which a detergent is incorporated possess excellent scalp- and skin-treating properties.

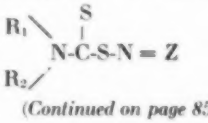
A preferred composition taken from the patent (U. S. 2694669) follows:

Composition of equal parts of selenium sulfide and bentonite	5.0
Bentonite	4.0
Monobasic sodium phosphate	1.0
Glyceryl monoricinoleate	1.0
Alkyl aryl sulfonate	17.0
Citric acid	0.2-0.5
Perfume	0.5
Water, q. s. to	100

The bentonite is wet with water and the alkyl aryl sulfonate is added and dissolved with stirring. Then glyceryl monoricinoleate and monosodium phosphate are similarly added and stirred in. After the solution has become uniform the selenium sulfide-bentonite powder is added in small amounts and stirring is continued until a uniform suspension is obtained. Then citric acid is added in a quantity sufficient to adjust the pH of the composition to about 4.5. The perfume is added and stirred in and water is added to bring up to volume. This product has a shelf life in excess of one year.

Cleansing Compositions Having Anti-Bacterial Properties

DuPont has finally gotten into the germicidal soap "act" as evidence by U. S. patent 2692862 issued to Paul Lipsitz and assigned to duPont. This patent asserts that disinfectant soaps and synthetic detergents of high antibacterial activity, of good retentivity on the skin and being non-toxic and non-irritating to the skin may be obtained by incorporating into cleansing compositions of the aforementioned types an agent of the formula:



(*Continued on page 858*)

Regal Chemical's Alphabet

A Aerosols

Regal has been a pioneer since 1943.

B Bottles

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C Containers

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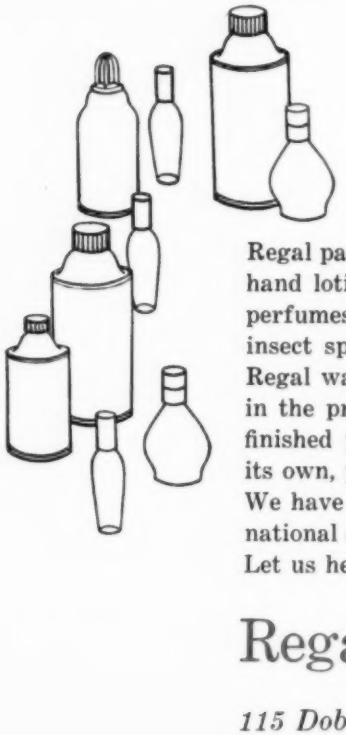

Regal packages pressure-propelled shave creams, shampoos, hand lotions, suntan lotions, hair-sprays, colognes, perfumes, deodorants — pharmaceuticals — insect sprays, moth sprays, room deodorants. Regal was the first to employ statistical quality control in the pressure packing industry, assuring uniform finished production. Regal distributes no products of its own, packing only for the trade. We have packaged for many well-known national distributors. Why gamble with inexperience? Let us help you. Your problems are our concern.

Regal Chemical Corporation

115 Dobbin Street, Brooklyn 22, N. Y.

NEWS...

Heine Promoted by Lilly

Robert E. Heine has been appointed director of Eli Lilly & Co.'s production planning division, succeeding George A. Meihaus who retired recently. For the last two years Mr. Heine has been assistant director of this division.

Piercy, Lederle Sales Mgr.

Charles K. Piercy has been named domestic sales manager Lederle Laboratories division, American Cyanamid Co., according to Henry Wendt, Jr., director of sales. Formerly assistant domestic sales manager, Mr. Piercy replaces T. B. Van Stone who resigned for reasons of health.

Dutchess Becomes Consultant

Dr. Charles E. Dutchess, formerly vice-president and medical director of Schenley Laboratories, opened a private consultant service on December 1. He has been in pharmaceutical work for the past 22 years, having first practiced private medicine in Detroit in 1921. He later joined the professional service and advertising department of Parke-Davis, where he remained from 1932 until 1944 when he joined Schenley.

Recently appointed chairman of the Medical-Surgical Advisory committee of the National Security Industrial Association, Dr. Dutchess is also a fellow of the American Medical Association, past president of the Association of Medical Directors, and chairman of the geriatrics committee of the Industrial Medical Association.

He has been succeeded at Schenley by Dr. B. Marr Lanman.

Anchor Hocking Appointments

Frank H. Baumgardner has been appointed sales manager of the Tropical Glass & Box Co., subsidiary of Anchor Hocking Glass Corp.

Philip W. Hatch has become sales manager of Anchor Hocking's closure division at Lancaster, Ohio.

Spence, V.P., Seaplant

Byron Spence has been elected vice-president in charge of sales, Seaplant Chemical Corp., according to Earl C. Jertson, president.

Kennedy on L & F Board

O. G. Kennedy, general sales manager of the Lehn & Fink division, has been elected to the board of directors of Lehn & Fink Products Corp., according to Edward Plaut, president. He has been with the firm since 1952.

CHARLES K. PIERCY

DR. CHARLES E. DUTCHESS

O. G. KENNEDY

Top Award to Lever House

Lever Brothers Co. received its fourth top award on November 15 when New York's Fifth Avenue Association presented Lever House with its biennial award for the "Best New Building" built in the midtown area of Manhattan during the past two years.

The Association's Committee on Architectural Awards, headed by L. J. Horan, president of J. & J. Slater, made the presentation to Jervis J. Babb, Lever president, at the company's annual luncheon.

Lever House, since its opening in May, 1952, has won recognition in different fields. It was voted the top 1952 Honor Award by the American Institute of Architects and was designated the "Office of the Year" by *Office Management and Equipment* magazine. It also received the Silver Anvil Trophy, from the American Public Relations Association, for the outstanding public relations achievement in American industry for 1952.

Promoted by Baker

Warren F. Schumacher has been appointed sales manager of the newly formed Fine and Industrial Chemical division of J. T. Baker Chemical Co., according to R. A. Clark, vice-president in charge of sales. These had formerly been two separate divisions, with Mr. Schumacher as sales manager of the fine chemical division.

Until 1951 manager of Baker's New York office, Mr. Schumacher will be assisted by W. Chapin Harris who has come to Phillipsburg from the Chicago branch office.

Givaudan Moves Cinn. Office

The Cincinnati office of Givaudan-Delawanna, Inc., and its associate companies, Givaudan Flavors, Inc., and Sindar Corp., moved to new and modern quarters last month in the Transportation Building, 307 East 4th St., Cincinnati 2. The telephone number will continue to be PArkway 8254.

Kalech, Pres., Flamemaster

Phil Kalech, formerly vice-president and sales director of the Toni Co., has been named president of Flamemaster Chemicals, Inc., a new firm which is making three products for the protection against home fires.

Mr. Kalech had also been general sales manager of the Pepsodent Co. and was one of the founders, and executive vice-president, of Tintair.

Volwiler to Receive Medal

Dr. Ernest H. Volwiler, president and general manager of Abbott laboratories, was awarded the Industrial Research Institute Medal for 1955 at the Institute's Fall meeting on October 27 in Chicago. The medal will be presented to Dr. Volwiler next May at the Institute's annual meeting at Buck Hill Falls, Penna., according to Howard G. Vesper, Institute president, and president of the California Research Corp.

Wishing You A
Joyous Christmas
and a
Bright New Year
D&O
ESTABLISHED 1798

G. C. BRADSHAW

WALTER S. KEUTZER

WARREN F. MICHENER

Goetchius with Ayerst Labs.

George R. Goetchius has been appointed to the research staff of Ayerst Laboratories, according to Boyd O'Connor, president. He was formerly with the New York State Department of Health, Sterling-Winthrop Research Institute and Rohm & Haas Co.

Fritzsche 25-Year Club Meets

George H. Ammersbach, Edward J. Potorski, Joseph A. Schneider and Francis C. Pinello, of Fritzsche Brothers' New York staff, and Erhard Kuhnert, of the Clifton plant, all new members this year of the company's Quarter-of-a-Century Club, were honored November 16 at a cocktail party and dinner held at the New York Athletic Club. Forty members and guests, the largest gathering in the Club's history, were present. Mr. Kuhnert was unable to attend.

Frederick H. Leonhardt, chairman of the board, and a sixty-years-of-service member, toasted the group and extended the Club's most cordial welcome to all present.

Each new member spoke briefly and sincerely of his happy years with Fritzsche Brothers. John H. Montgomery, Fritzsche president, acting as master of ceremonies, contributed much to the celebration's enjoyment by his warmth and gracious good humor in conducting the meeting and introducing the various speakers. In addition to Mr. Leonhardt and Mr. Montgomery, and the former's secretary, Mary G. Neary, the party included most of the active Club members and the following officers: Vice-presidents H. P. Wesemann, Dr. Ernest Guenther and Fred H. Leonhardt, Jr.; John L. Cassullo, treasurer; D. A. Neary, secretary; Arthur J. Hemminger, assistant secretary; Gustave A. Wohlfort, assistant treasurer; and Ellis F. Merkl, comptroller.

Mallinckrodt Promotions

G. C. Bradshaw, western division sales manager, has been promoted to director of sales research, Mallinckrodt Chemical Works, according to Joseph Fistere, president. Two other promotions include those of Walter S. Keutzer, formerly assistant sales manager, now western division sales manager, and Warren F. Michener, formerly temporarily in charge of the Chicago regional office, now assistant western division sales manager.

Testagar Expands

Testagar & Co., Inc., has opened a southwestern terminal office in Dallas to provide improved customer service in the distribution of its pharmaceutical products in the southwestern and south-central states.

The company plans to open a Pacific Coast distribution center in the near future.

New Plant, Gibraltar Paper

Gibraltar Corrugated Paper Co. has opened a new plant for its display division at 3 Entin Road, Delawanna, N. J. The plant has been built expressly for the creation and production of all types of corrugated point-of-purchase display material.

Versenes Bought by Dow

Versenes, Inc., formerly known as Bersworth Chemical Company, of Framington, Mass., has been purchased by the Dow Chemical Company, all outstanding stock being acquired by Dow in a cash transaction. This company is a producer of chelating agents which it sells under the trade name, Versene. These chemicals, also called sequestering agents, have the ability selectively to inactivate or combine with various metal ions. In our April, 1954, issue we published an article by Martin Rubin, Associate Professor, Chemo - Medical Research Institute, Graduate Chemistry Department, Georgetown University, Washington, D. C., describing the use of these products in medicine. In addition to their use in medicine, these products are used in the detergent, soap, textile, metal, agricultural, rubber, chemical, petroleum, and related industries. Dr. F. C. Bersworth, former president of Versenes, Inc., becomes a Dow research consultant.

Minnig Retires from Witco

Carl J. Minnig, for many years a vice-president of Witco Chemical Co., retired on October 1. He is being retained as a consultant and will be available to his many customers and friends.

Members and guests attending Fritzsche Brothers' Quarter-of-a-Century Club at recent cocktail party and dinner, New York Athletic Club, in honor of Club's new members. Standing at head table are, left to right: H. P. Wesemann, vice-president; Mary G. Neary; F. H. Leonhardt, chairman of the board; John H. Montgomery, president; and Fred H. Leonhardt, Jr., vice-president.

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- Bactericides
- Belt Lubricators
- Chrome Preservatives
- Dust Absorbers
- Dye Penetrants
- Fabric Color Sprays
- Flower Tints
- Glare-Proof Glass Sprays
- Graphite Lubricants
- Gun Oils
- Hosiery Protectants
- Household Products
- Ignition Coatings
- Ignition System Driers
- Insecticides & Herbicides
- Insulation Coatings
- Lubricants
- Metal Lubricants
- Metal Polishes
- Mildew Preventives
- Mold Release Sprays
- Paints & Lacquers
- Penetrant Oils
- Plastic Protective Coatings
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For most applications, mixes of "Genetron" 11 and "Genetron" 12 offer optimum vapor pressures and excellent compatibility with a wide range of materials. With them you can select and get the ideal performance characteristics for your particular product.

The 50-50 mixture of "Genetrons" 11 and 12 has proven to be the most adaptable blend for the bulk of general uses. Other combinations varying from 25 to 90% "Genetron" 12 provide the answer for many hard-to-formulate materials ranging from low-pressure specialties to high-pressure space sprays. That's because variations in the proportions of "Genetrons" 11 and 12 result in corresponding variations in the particle size of the spray, solubility characteristics, and hydrolysis rates.

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Another useful aid: Ask for up-to-the-minute "Genetron" aerosol bulletin which contains lists of contract fillers, valve and container manufacturers; other suppliers you will want to know about in considering your aerosol program.

For further information, call or write your nearest General Chemical office.

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In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

BURTON F. BOWMAN

Bowman with Cyanamid

Burton F. Bowman, formerly vice-president in charge of sales of Huron Milling Co., has been appointed general sales manager of the fine chemicals division, American Cyanamid Co. He will direct the operations of the pharmaceutical, animal feed and food industry sales departments and also the activities of the advertising and market research departments.

Geer Heads P-D Records

Dr. Harriet A. Geer has been appointed senior research chemist for Parke, Davis & Co., according to Dr. Leon A. Sweet, vice-president and director of research and products development. She will become head of the central records office.

Warwick Distributor Changes Name

Dixie Solvents and Chemicals Co., formerly known as Amsco Solvents and Chemical Co., is now the exclusive distributor in Kentucky of Warick Wax Co., division of Sun Chemical Corp.

Glass Promotion Week

"Buy It in Glass Week" was held in Millville, N. J., from October 25 to 30. It proved so successful that it may become an annual affair celebrated on a national scale, according to the Armstrong Cork Co. which has a glass plant in that area, along with the T. C. Wheaton Co.

The promotion, which pointed up the tremendous growth of the glass container business, was a success because of the close cooperation of local unions of the Glass Bottle Blowers Association (AFL), Millville glass industries and the community. The Week was sponsored by GBBA, whose purpose, as stated in their resolution, was "to educate the people of Millville on the importance of the glass industry to their economic and social welfare."

A. V. Schubert, left, executive vice-president, Emery Industries, Inc., congratulating John Neuner on his 50th anniversary with company.

Neuner Feted by Emery

John Neuner, with the development and service laboratories of Emery Industries Inc., recently received a diamond service pin in recognition of his 50 years of service with the firm. He was presented the award by A. W. Schubert, executive vice-president, at a special luncheon. Also present were Robert Van Tuyle, vice-president in charge of production; Robert Aylesworth, manager of development laboratories; and Ralph Sheets, director of industrial relations.

Mr. Neuner first began working with the company when he was 13 years old and spent much of his time with the Candle division.

Cook with Applezweig

Marvin Cook, former chief chemist of June Dairy Products Co., has been appointed director of the food and flavor laboratories of Norman Applezweig Associates.

BERNARD POLAK

B. Polak Becomes President

Bernard Polak has been named president of Polak's Frutal Works, Inc., succeeding his brother, the late Frits J. Polak who died in the K.L.M. accident in Shannon, Ireland, September 5.

Opens West Coast Branch

Morningstar, Nicol, Inc., has opened a West Coast branch office and warehouse at 274 Brannan St., San Francisco. These facilities will be used by Morningstar as well as by its subsidiary, Paisley Products, Inc., manufacturer of packaging and paper converting glues, industrial adhesives and polyvinyl resin emulsions.

J. B. Morningstar, a great grandson of the original founder, has been transferred from the New York sales staff and is now manager of the new West Coast office where he will handle sales of the combined Morningstar-Paisley product line.

Frank Pugliese, Armstrong Cork Co., and George Baumbach, president of Millville, N. J., Local 257 of Glass Bottle Blowers Association (AFL), look on as Harry E. Minkwitz, left, president of Local 7, GBBA, and W. W. Pedrick, manager of Armstrong Millville glass plant, shake hands on success of "Buy it in Glass Week," held in Millville, October 25-30. Group is standing in front of one of 125 displays of glass-packaged products, supplied by national manufacturers, which were exhibited in Millville stores, banks, high school and civic organizations.

D&O Nat. Sales Meeting

The annual Dodge & Olcott national sales meeting took place at the Hotel New Yorker from October 17 through 22. The affair brought together company officers, executive and technical personnel and the entire national sales staff for a week of intensive discussion, demonstrations and plant tours.

President John L. Cassullo discussed Administrative Subjects on Monday morning, while Val H. Fischer, vice-president, delivered a Market Analysis of Essential Oils.

Later in the day at a perfume session Gus Schwindeman, Herb Kainik and Mysie Emmet, perfume chemists, explained the latest developments in the fields of industrial odorants, aerosol products, cosmetic perfumery and perfume specialties.

On Tuesday morning the entire group made a special morning tour of the Colgate-Palmolive Co. plant in Jersey City, arranged by George Livesay, and an afternoon trip to Suffern, N. Y., where, through the courtesy of Dr. Edward Jarmus and Thomas Chisholm, they were escorted through the plant of Avon Products, Inc.

On Wednesday, the Flavor Session included a discussion of Candies and Confections by Frank Pond; Spiceolate and Spisoresin Flavors, by Claude Johnstone; Vanilla Products, by Charles Dwyer; and Flavors for Beverages and Pharmaceuticals, by Willem Lasthuysen.

The Thursday meeting took place in the recently constructed D&O Dry Soluble Seasonings Plant in Hawthorne, N. J., where discussions and demonstrations of plant equipment and methods were given by William Ammon, Jack Hohhof and other laboratory and sales personnel of the new division. The newly appointed director, Hatton B. Rogers, was introduced to the sales group.

The meetings were finished on Friday with a morning visit to the laboratory and executive offices of the New York office and an afternoon "Question and Answer" session at the New Yorker Hotel.

Van Ameringen Replaces "Endor"

Van Ameringen-Haebler, Inc. has changed the brand designation of all of its industrial odor control materials to the name, Vandor. This new trademark replaces "Endor" which had previously been used.

John L. Cassullo, president, Dodge & Olcott, Inc., discussing operation and function of newly enlarged aerosol testing laboratory with national sales group during company's sales meeting in New York from October 17 to 22.

Royer in Cyanamid Post

Dr. George L. Royer has been named administrative assistant to the general manager of American Cyanamid Co.'s research division. He will coordinate policies on budgets, personnel and publications at the division's laboratories in Stamford, Conn.; Pearl River, N. Y.; and Bound Brook, N. J.

DR. GEORGE L. ROYER

Pfizer Annual Report Best

In ceremonies at the Statler Hotel, October 25, Chas. Pfizer & Co. received a Best of Industry "Oscar" in the drug field classification for the excellence of its 1953 Annual Report. The award was presented by *Financial World* magazine, sponsor of the competition in which more than 5,000 annual reports are judged each year.

Edwin H. Smith, controller, accepted a plaque, symbolizing the top honor, on behalf of John E. McKeen, chairman of the board and president of Pfizer. Mr. Smith paid tribute to Guy S. Saffold, agricultural advertising manager, who was responsible for much of the annual report, but added that the entire job was one of teamwork by the full staff.

Zorn Heads Upjohn Branch

Karl B. Zorn, divisional sales manager of the Los Angeles branch of the Upjohn Company, has been named sales manager of that branch, succeeding Leo B. Austin, according to W. F. Allen, vice-president and director of sales. Mr. Austin is retiring from the post, having been with the company 45 years.

Ashe Honored by Squibb

Lauren H. Ashe, professional manager, E. R. Squibb & Sons, was recently awarded a solid gold pin encrusted with two diamonds in recognition of his outstanding 30-year service. E. T. McHargue, Squibb director of advertising and marketing, presented Mr. Ashe with the pin in an office ceremony attended by a number of company officials.

Lauren H. Ashe, professional manager, E. R. Squibb & Sons, receiving solid gold pin with two diamonds in recognition of outstanding service. Presenting pin is W. R. McHargue, right, Squibb director of advertising and marketing, in an office ceremony attended by several company officials.

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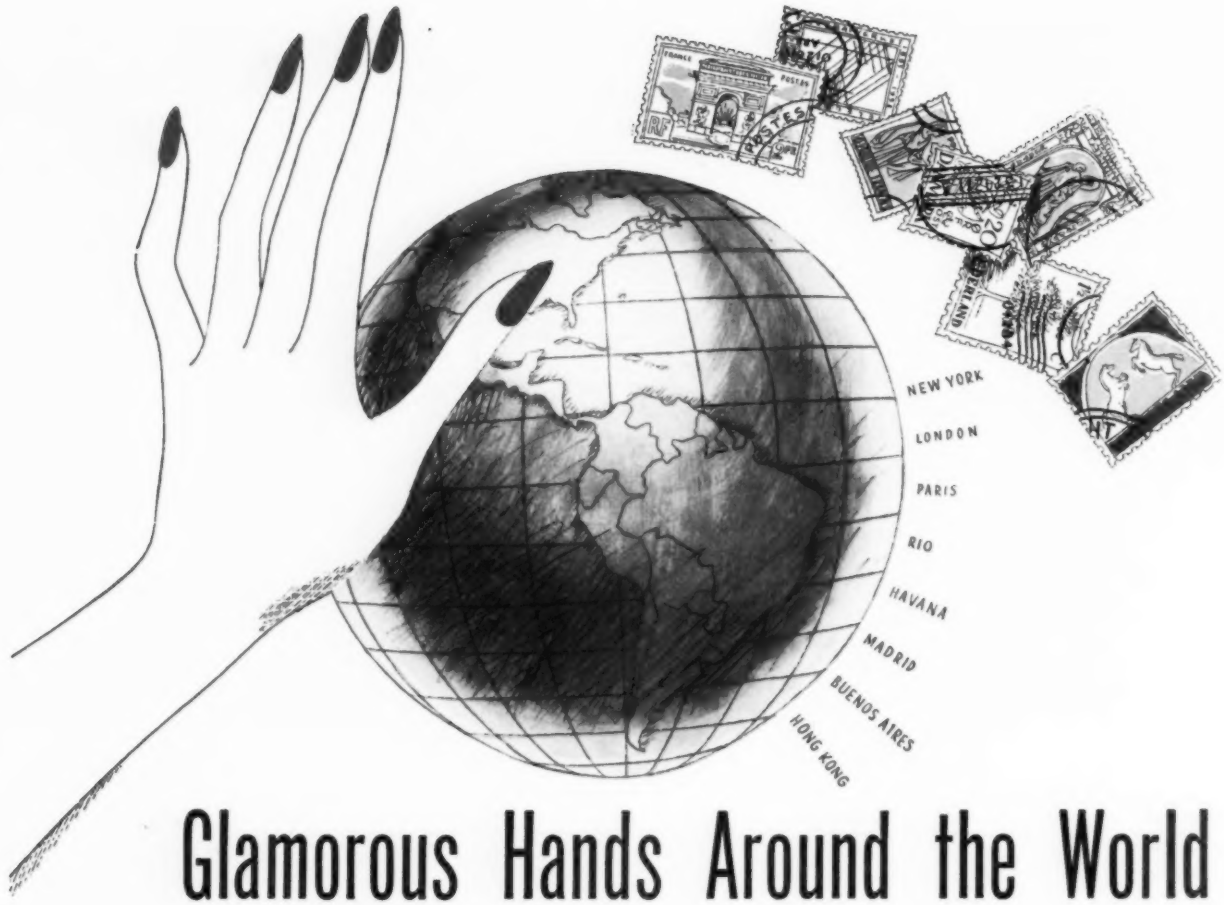

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Geigy Adds to Field Staff

Geigy Pharmaceuticals has appointed 10 specially trained professional service pharmacists to the field staff, according to Arthur F. Peterson, head of sales and distribution.

50th Wedding Anniversary

Mr. and Mrs. B. T. Bush celebrated their 50th wedding anniversary on December 15 at the Molly Pitcher Hotel, Red Bank, N. J. Immediate relatives joined in the celebration.

Mr. Bush, a pioneer in the synthetic aromatic chemical industry, retired from active management of the Aromatics Division of the Dow Chemical Co. in 1953, after nearly fifty years in the aromatic industry. He served as first president of the Salesmen's Association of the American Chemical Industry and as chairman of the D.C.A.T. section of the New York Board of Trade in 1927.

Mr. and Mrs. Bush are now living at 1600 Gay Drive, Orlando, Florida.

Becton to Buy Wilson Rubber

Becton, Dickinson & Co. has offered to purchase the outstanding stock of Wilson Rubber Co., Canton, Ohio, according to D. Wayne Johnson, vice-president If Becton Acquires control of the company, it will retain the entire organization intact and will continue to operate the two plants in Canton, Ohio.

The transaction is expected to be completed by the end of this month.

Join CSC Sales Staff

Richard E. James, formerly with Swift & Co., has been assigned to the Los Angeles district office of Commercial Solvents Corp., according to F. E. Maple, general manager of the industrial chemicals sales department. Thomas B. Gilday, formerly with Winthrop-Stearns and the Northeastern Resin Co., is now with the Boston district office.

New members of the Geigy Chemical Corp. field staff, left to right, back row: N. J. Miceli, L. L. Cetrullo, R. E. Mason, R. L. Ploussard, P. Bell, R. F. Severson, R. Diamond and J. N. Wohl. Front row: P. Groebner; P. L. Stucker, advertising manager; Arthur F. Peterson, in charge of sales and distribution; E. Hammer, president; P. S. MacDougal, field sales manager; and S. T. Sagmiller.

Atlas Appointments

Edward J. Goett, formerly head of the commercial development department of Atlas Powder Co., has been elected a director and vice-president of the firm, in charge of the company's chemicals, Darco and commercial development departments.

W. Clayton Lytle has been named general manager of the Atlas chemicals department, succeeding Kenneth E. Mulford who was appointed to assist Mr. Goett.

Hazel-Atlas Appointments

E. F. Westwood, formerly manager of the Pittsburgh sales office, has been appointed district sales manager of the Hazel-Atlas Glass Company's Chicago sales office.

M. C. Robinson, formerly sales representative of the Minneapolis sales office has succeeded Mr. Westwood in Pittsburgh.

S. W. Keller has been appointed district sales manager of Hazel-Atlas' Cincinnati sales office. He had formerly been assistant to R. E. Dyer, previously manager of the Cincinnati sales office, now retired.

Bristol-Myers International

Bristol-Myers Co. has established Bristol-Myers International as a separate functioning organization of the firm, according to Lee H. Bristol, president. The International company will handle the production and marketing for all Bristol-Myers proprietary products throughout the world, exclusive of the United States and Canada.

Officers of the division are William M. Bristol, chairman of the board; Edward G. Ladewig, president; Francis S. Milovich, vice-president; James Hamilton, treasurer; and Donald L. Sanders, secretary.

Rowland with Carbide

K. H. Rowland has been appointed assistant works manager of Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp., according to H. D. Kinsey, vice-president.

Roy with Colton

James V. Roy, Jr., has been appointed to the staff of the New York sales office of Arthur Colton Co., according to Kenneth B. Hollidge, executive vice-president.

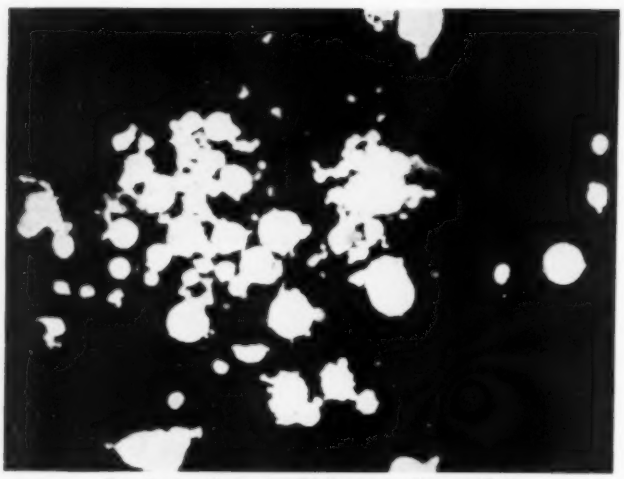
RICHARD E. JAMES

THOMAS B. GILDAY

JAMES V. ROY, JR.

WHICH MAGNESIUM TRISILICATE DO YOU NEED?

»» Baker offers drug and pharmaceutical manufacturers 4 different types of Magnesium Trisilicate.



Free flowing Magnesium Trisilicate greatly magnified.

SEVEN SPECIAL ADVANTAGES OF

Baker Magnesium Trisilicate, U.S.P. Free flowing, Medium Powder

FREE FLOWING • MIXES READILY

UNIFORM PARTICLE SHAPE

LESS DUSTY • CAN BE DRY-SLUGGED

COATS EVENLY • FEEDS UNIFORMLY

Available in 25 and 100-pound containers.

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MEDIUM POWDER

LIGHT POWDER

EXTRA LIGHT POWDER

»» Baker *free flowing* Magnesium Trisilicate, a medium-density powder with spheroid particle structure, has won quick acceptance. It is especially adaptable to tablet manufacture or other uses where moderate bulking properties are required. This material can be wet-granulated, or dry-slugged with resulting economy.

Some manufacturers find that a lighter Magnesium Trisilicate, with lower bulk density, better suits particular formulations or equipment. You have a further selection with Medium Powder, Light Powder, or Extra Light Powder.

The big point is that Baker offers all four popular types of Magnesium Trisilicate. And all four fully meet the acid consuming capacity and other requirements of the U.S. Pharmacopoeia XIV.

Which Magnesium Trisilicate best fills your needs? Ask for samples for testing. If special physical or chemical specifications are required, perhaps we can manufacture your Magnesium Trisilicate to your own standards. We do this for companies who can order in sufficient volume. Simply address J. T. Baker Chemical Co., Phillipsburg, New Jersey.

Baker

Baker Chemicals

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DR. I. S. DANIELSON

ANTHONY ESPOSITO

CHARLES ZANDITON

Heads Biological Prod., Lederle

Dr. I. S. Danielson, formerly manager of viral and rickettsial production, Lederle Laboratories division, American Cyanamid Co., has been named manager of biological production, according to D. M. Benjamin, executive director. He will be responsible for the production of all Lederle vaccines and serums.

Vale Chemical Expands

Vale Chemical Co., pharmaceutical manufacturer of Allentown, N. J., has acquired the printing plant of Searle and Bachman in order to obtain room for further expansion. Vale was founded 36 years ago by Elliott V. Davis, president, and has done business at 814 Gordon St. for more than 30 years. By purchasing the 17,500-square-foot building, the company has provided more space in which to consolidate a manufacturing laboratory, warehouses and administration, all under one roof.

Cavell Visits Parke, Davis

Sir Gordon Cavell of Epsom, England, and a consultant on malaria to the World Health Organization, recently visited Parke, Davis & Co., conferring with company officials. Prior to his Parke, Davis trip he attended the meetings of the American Society of Tropical Medicine and Hygiene and the American Society of Parasitology in Memphis, Tenn.

Wampole Appointments

Ronald F. Sheppard, formerly branch sales manager for Lambert Pharmacal Co. in England, has been appointed associate export manager of the export department, Henry K. Wampole & Co.

Donald J. Fye, formerly with the Glidden Co., has been appointed district sales manager.

Harry E. Ross, previously with Smith-Dorsey Co., has become Wampole district sales manager for the West Coast division.

Esposito, V.P., Bymart

Anthony Esposito has been elected a vice-president of Bymart-Tintair, Inc., according to Martin L. Straus II, chairman and president. He is in charge of research, product development, quality control and manufacturing.

Brennan Heads Gray Pharm.

John Brennan, formerly director of sales training and sales service, and also New England district manager for White Laboratories, has been appointed president of the Gray Pharmaceutical Co.

Graves Represents MM&R

W. Warfield Graves, Jr., has been appointed representative of Magnus, Mabee & Reynard, Inc. in Michigan and surrounding areas. His headquarters will be in Royal Oak, Mich.

Zanditon with Produits Nina

Charles Zanditon, former president of Pepsinic Seltzer Corp., has been appointed vice-president and general sales manager of Produits Nina, Inc., according to Margery Merrick, president.

New U.S.I. Warehouse Plant

National Distillers Products Corp. has purchased about three and one-half acres of water-front property on the south side of the Central Railroad of New Jersey overpass, Doremus Ave., Newark, N. J., according to Lee A. Keane, director of chemical sales. Work has been started on a new plant at this site to be used by U. S. Industrial Chemicals Co. division for warehousing and distribution of alcohols and other chemicals. The plant will have a capacity for handling over 10 million gallons a year.

William H. McLean, vice-president and general manager of chemical division, Merck & Co., buying stock in junior concern (J. A. Cosmetics Co.) from William Malovetz, left, production manager; Veronica Hatko, secretary; and James Yuhasz, president. Formed by group of Rahway, N. J., high school students, the miniature firm has leased production facilities from Merck and will manufacture and sell Purr hand lotion. Firm will be liquidated in May.

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A valuable aromatic Compound
for users of Lavender oil !
Stable
Lasting
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Economical
Schimmel & Co., Inc.
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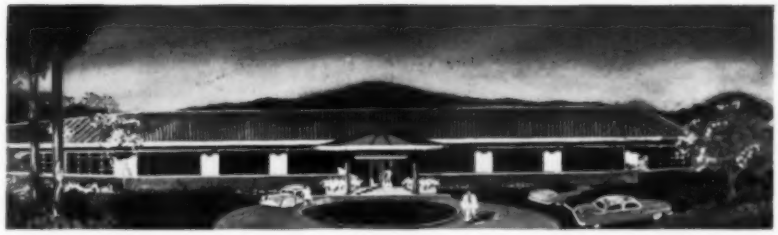
Two New P-D Foreign Plants

Parke, Davis & Co. opened a $2.5 million pharmaceutical plant near Sydney, Australia, last month, the fifth, and largest, overseas manufacturing laboratory to be built in the past two years. W. R. Jeeves, Parke-Davis vice-president and director of overseas operations, who attended the opening ceremonies stated that the laboratory and general office will serve all of Australia, its possessions and protectorates and New Zealand.

T. J. White is general manager of the new operations, while F. W. Ritchie is sales manager and V. E. Linton-Frost, laboratory superintendent.

Earlier in November the company opened its first branch office and manufacturing laboratory in the Philippines, about 10 miles southeast of Manila. This is the fourth new overseas manufacturing facility opened by Parke-Davis in the last two years.



Architect's drawing of Parke, Davis & Co.'s first branch office and manufacturing laboratory in the Philippines. This is the 4th new overseas manufacturing facility opened by the firm in the last two years.

Lever Names Two V.P.'s

Dr. L. B. Parsons, director of research and development, Lever Brothers Co., and David J. Bunnell, general manager of the buying division, have been elected vice-presidents of the company, according to Jervis J. Babb, president.

Weeks Joins P&S Sales Staff

Charles E. Weeks has been added to the New England sales staff of Polak & Schwarz, Inc. He had previously spent an intensive study period at the New York sales headquarters and in the manufacturing plants and laboratories in New Jersey and New York.

Conner with Schering

Roy R. Conner, formerly with the Pitman-Moore division of Allied Laboratories, Inc., has been appointed marketing manager for veterinary products of Schering Corp., according to Herman W. Leitzow, domestic sales manager.

ROY R. CONNER

1955 Folding Carton Contest

The Folding Paper Box Association of America is inviting all members to participate in the 1955 Folding Carton Competition, entries for which must be submitted before midnight, December 31. A maximum of 100 awards will be presented, ranging from First Awards and Awards of Merit to "America's 100 Best Folding Cartons."

James Promoted by Lederle

Maxwell James, formerly assistant regional manager of the Lederle regional office in New Orleans, has been appointed manager of wholesale sales for Lederle Laboratories division, American Cyanamid Co. He replaces Thomas L. Floyd-Jones who has been transferred to Cyanamid's fine chemicals division as manager of pharmaceutical sales.

MAXWELL JAMES

Albertus J. Edgar

Albertus J. Edgar, traffic manager for Lederle Laboratories division, American Cyanamid Co., since 1946, died October 29 after a long illness. He was 57 years old.

He is survived by his wife, Clara, three sisters and two brothers.

R. A. Stephen

R. A. Stephen, treasurer of the J. L. Ferguson Co., died suddenly on October 21. He had been associated with the firm for 32 years.

Edward V. Killeen

Edward V. Killeen, retired president of George Lueders & Co., died November 10 in Peck Memorial Hospital, Brooklyn, at 83 years of age. He joined the company in 1891, becoming secretary in 1906, vice-president and general manager in 1916, and president from 1930 to 1940.

Surviving are his wife, Julie; a son, Wilbur; two daughters, Mrs. Ruth K. Martin and Mrs. Clare K. Sullivan; a sister, Sister Miriam Anita; thirteen grandchildren and four great-grandchildren.

Frederick L. Murphy

Frederick L. Murphy, manager of government sales and medical exhibits for Lederle Laboratories division, American Cyanamid Co. since 1947, died suddenly November 4 at his home in Mamaroneck, N. Y.

He was a Lederle medical representative in New York, Indiana, Brooklyn and Long Island. In 1938 he became New York branch manager; in 1942, southeastern regional manager; and in 1945, manager of Lederle's branch warehouses.

Mr. Murphy is survived by his wife, Madelon.

Dr. Zachary A. Blier

Dr. Zachary A. Blier, research director of the Smith-Dorsey division of the Wander Co., died suddenly in a New York hotel while on a business trip. He had formerly been associated with L. G. Maison & Co., Chicago.

Russell Boland

Russell Boland, eastern advertising manager for the Topics Publishing Co., died on November 5 in Lawrence Hospital, Bronxville, N. Y., after a long illness. He was 49 years old.

He is survived by his wife, Jane; a daughter, Mary; add a sister, Mrs. Charles Lee.

Give your aerosol product the advantage of a GIVAUDAN CUSTOM-MADE FRAGRANCE

The problems of compatibility, corrosion, solubility and fixation are especially complex in connection with odor selection for aerosols. Further, the choice of propellants and other ingredients, and the type of container all affect the performance of an aerosol fragrance, so that its selection becomes properly a matter for experts.

Such experts are ready to serve you at Givaudan's special Aerosol Research Laboratory. Our staff will welcome the opportunity to recommend, adapt, or "custom-make" a fragrance for your aerosol product which will give distinctive sales appeal and the utmost satisfaction under the particular conditions governing its formulation and use. We invite your inquiries.

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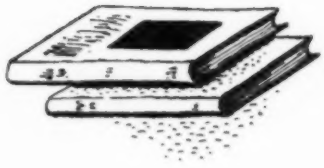


Trade Literature

Pamphlet on Pyrrole

Pyrrole, an extremely reactive chemical compound with a number of unusual characteristics, is described in a 12-page technical bulletin issued by the electrochemicals department, E. I. du Pont de Nemours & Co., Wilmington, Del.

Blenders and Mixers

J. H. Day Company, Dept. 21, 1144 Harrison Ave., Cincinnati 22, Ohio, has issued an eight-page folder (bulletin 800) on blenders and mixers which includes the latest models and construction features. Profusely illustrated, the folder completely describes Day Ribbon Blenders and Day Jumbo Mixers, which can be used for mixing powders, pastes or liquids.

Carton-Filling, Sealing Machines

Claybourn Machine Corporation, 6481 W N. Avondale Avenue, Chicago 31, has issued an illustrated brochure describing automatic and semi-automatic carton - filling and sealing machines.

Sonneborn Booklet

L. Sonneborn Sons, Inc., 300 Fourth Ave., New York 10, has issued a 36-page booklet entitled, More Than Meets the Eye. This beautifully produced and profusely illustrated booklet gives complete information concerning the products of the company and when and where they are used. It is very well written and makes for most interesting reading.

Proposals for Export Credit

The New York Board of Trade, 291 Broadway, New York 7, has issued a 36-page booklet outlining Proposals for Export Credit and Exchange Transfer Guarantees. The proposals are for a system of private and governmental guarantees against hazards faced by exporters when selling abroad on credit terms.

Alkyl Halide Bulletin

Aceto Chemical Co., 40 Lawrence Street, Flushing 54, N. Y., has issued a new technical bulletin on alkyl halides. Described in the bulletin are the alkyl halides of various chain lengths (Myristyl, C-14; cetyl, C-16; and stearyl, C-18), as well as alkyd bromides ranging from C-10 to C-18 chain lengths (decyl, C-10; lauryl, C-12; myristyl, C-14; cetyl, C-16; and stearyl, C-18).

AMP Booklet

Schwarz Laboratories, 230 Washington Street, Mount Vernon, N. Y., has issued a new bulletin giving basic data on adenosine-5-phosphoric acid, frequently referred to as AMP. The bulletin outlines clinical investigations and reports therapeutic effects noted. The product has been applied in cardiac and vascular diseases, arthritis, bursitis, tendinitis, jaundice, diabetes, dermatitis, ulceration, and certain malnutritional diseases. Also given are physical, chemical, and biochemical properties of AMP, and a bibliography.

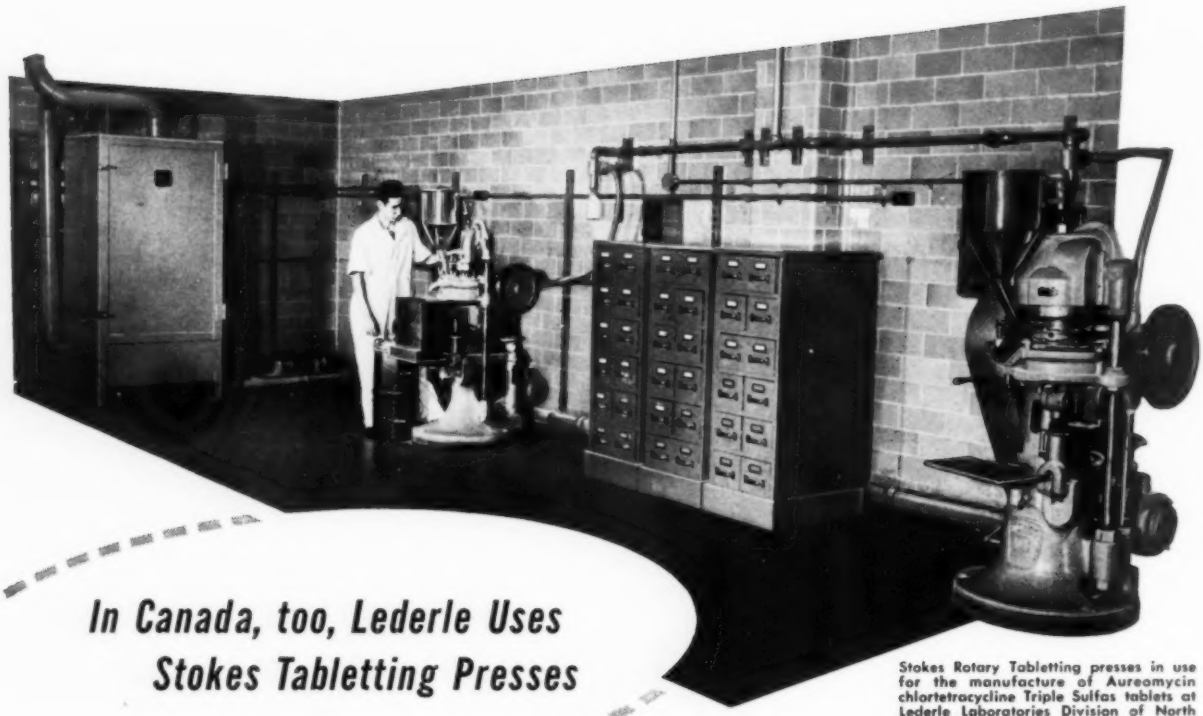
Isotope-Labeled Compounds

Bio-Rad Laboratories, 800 Delaware Street, Berkeley, Calif., has issued a new list of isotope-labeled compounds available. Included is an alphabetical index of compounds, including alternate nomenclature, and providing index numbers to location in the chemical classification list. Compounds include simple carbon compounds, alcohols and derivatives, amino acids, purines and pyrimidines, miscellaneous compounds, and nitrogen-15 labeled compounds.

Ethyl Benzene Data

Carbide and Carbon Chemicals Company, 30 East 42 Street, New York 17, has issued technical bulletin F-8596 giving information on ethyl benzene. Physical, chemical, and physiological properties, specifications, shipping container data, and suggested applications are given.

The same company has also issued booklet F-6136, entitled Physical Properties of Synthetic Organic Chemicals, featuring 46 new products available from the company.



Stokes Rotary Tabletting presses in use for the manufacture of Aureomycin chlortetracycline Triple Sulfas tablets at Lederle Laboratories Division of North American Cyanamid, Ltd., Montreal, P.Q. Stokes drying cabinet in background.

In Canada, too, Lederle Uses Stokes Tabletting Presses

At the Lederle Laboratories Division of North American Cyanamid, Ltd., in Montreal, in a strikingly modern and efficient plant, Lederle Aureomycin chlortetracycline Triple Sulfas tablets are made. They are produced on Stokes rotary presses whose efficiency appropriately matches their modern surroundings. Artane trihexyphenidyl and Sulfonamide tablets are made on the same equipment.

It is their notable dependability which has long made Stokes presses popular throughout the world, often at points far removed from sources of parts or mechanical service.

The Lederle Laboratories Division of American Cyanamid Company at Pearl River, N.Y., also uses Stokes tabletting presses, both rotary and single-punch types, to make over 200 tabletted products.

Send for the booklet "How to Save Money on Punches and Dies" and for Catalog No. 801, "Stokes Tabletting Presses."

F. J. STOKES MACHINE COMPANY
PHILADELPHIA 20, PA.

STOKES

STOKES MAKES: High Vacuum Equipment, Vacuum Pumps and Gages / Industrial Tabletting, Powder Metal and Plastics Molding Presses / Pharmaceutical Equipment

Management Forum

by Francis Chilson
INDUSTRIAL CONSULTANT

Savings

Many engineers and production men rate their performance and value to their companies on the basis of savings they have made. But what are savings? If for example technical people reduce ex-factory cost by ten percent, they can by simple arithmetic compute the savings. If for example net sales are a million dollars and technical people have reduced ex-factory costs—or cost of sales as many people call it—from forty percent to let us say thirty percent, they can rightly say they saved the company $100,000.00. In other words they can say that they kept the company from spending that amount in producing the same amount of goods.

But here's the rub: the reference point, sales. If sales for the succeeding period had gone down the savings wouldn't have been so great. If on the other hand because of that saving sales went up because the marketing department had more money to spend on advertising, deals or what have you, the marketing department can say—and usually does—"Goddamit, whaddya mean you saved all that dough? *We* saved it because we brought in more volume for your plant."

But top management says, "Nobody saved anything. If they had our profits would have been increased by the amount of the saving and the money would be in the bank." Top management in such cases frequently forgets that during the period under discussion, more money was spent in advertising, more money was spent in administrative costs. Maybe even Mr. Brasshed himself got a fat raise.

The simple fact is that all costs of operating a business and all taxes and profits arising therefrom must be paid out of the difference between what the goods cost to manufacture and deliver to the factory door and what was received from the sale of that goods. Unless the money is borrowed from the banks or is received from the sale of stock, a business must operate on the difference between net sales and ex-factory cost. Stock revenue and bank loans are temporary and must be paid off in one way or another from the same pool.

Some managements seem to feel that if a "saving" let us say in labor has been made it means that the plant manager made the labor force rebate some of the wages they had been given. Some managements refute the idea of saving on labor unless the payroll of one period as compared with another actually decreased. Some managements discount completely the productivity of a labor force which may double its output without increasing the total payroll. In some instances I have known payrolls to be increased sharply but unit labor costs were dropping sharply. Some managements seem utterly incapable of thinking in terms of unit cost instead of total dollars of expenditure.

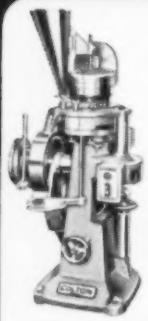
Many if not most managements are utterly incapable of appreciating the value of what might be called "preventive saving." Sometimes—and very frequently—a technical man will prevent his management from making substantial expenditures in new equipment or enterprises. Surely in such instances the money is saved because it otherwise would have been lost. But does management ever appreciate that? Never! If the technical man were at a later date to point out that he had saved the management the sum which it otherwise would have lost, management retorts, "How the hell can you say we saved any money when we didn't spend it?"

Yet all saving is of that character in a sense. You can't save anything on what you have already spent excepting in some few instances where suppliers rebate overcharges. All you can do is to establish a basis or ratio so that future expenditures for a given volume will be less percentagewise than they were formerly.

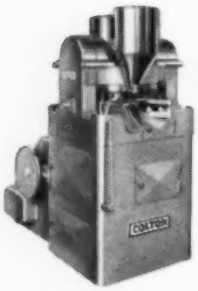
No saving, however, is possible without some reference point. Market price is the reference point for the purchasing agent. Net sales is the reference point for the plant manager. Profit ratio is the reference point for the marketing executive.

But you should never forget that saving is your job. There is no reason why you should be patted on the back every time you do your job. Maybe the "saving" of

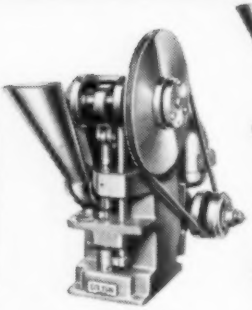
COLTON— FIRST NAME IN HIGH-PRODUCTION EQUIPMENT FOR 70 YEARS



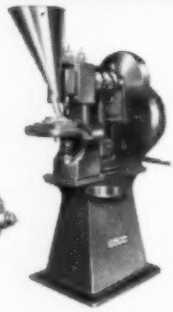
TABLET PRESSES. Single Rotary—Nos. 216; 240; 250; 270. Up to 1150 tablets per min. Up to 2" tablet dia.



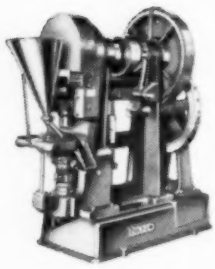
TABLET PRESSES. Double Rotary—Nos. 227; 233; 241; 260. Up to 2900 tablets per min. Up to 1¾" tablet dia.



TABLET PRESS. Single Punch. Bench Type — No. 301. Up to 65 tablets per min. Up to ½" tablet dia.



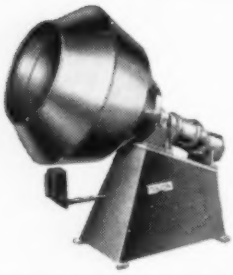
TABLET PRESSES. Single Punch—Nos. 320; 330; 340. Up to 120 tablets per min. Up to 1¼" tablet dia.



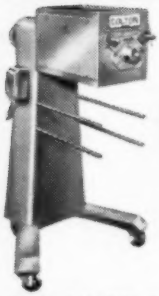
TABLET PRESSES. Single Punch, Heavy Duty—Nos. 345; 350; 360. Up to 85 tablets per min. Up to 3" tablet dia.

TABLET and CAPSULE COUNTERS—No. 715 Single; No. 705, 5-Bottle; No. 710, 10-Bottle.

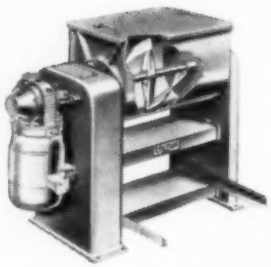
THE ONLY COMPLETE SERVICE TO THE DRUG AND COSMETIC INDUSTRIES



COATERS: POLISHERS: BLENDERS:—No. 36. Laboratory Size; No. 26. Bench Size; No. 16. Standard Size; No. 56. Tilting Type; No. 46. Large Blender.



GRANULATORS. Dry—No. 540 Single; No. 544 Twin. Also, Wet Granulators No. 551, 4-Blade; 561, 6-Blade.



MIXERS. Dry—No. 617, 17 Gal.; No. 636, 36 Gal.; No. 685, 85 Gal.; No. 695, 175 Gal. Also, Paste Mixers.

DRYING OVENS—No. 1018, 10-Tray Lab.; No. 2030, 20-Tray Cabinet; No. 4030, 40-Tray Truck.

STAINLESS STEEL STOCK POTS & TANKS—All types, open and closed. All sizes up to 5,000 Gal.

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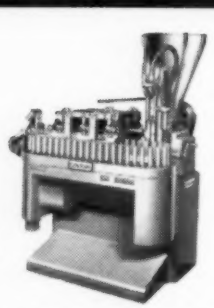
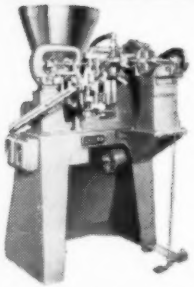
MULTIPLE SPOUT LIQUID FILLERS—32 to 480 fills per min. Up to 4 Fl. Oz. 4, 6, 8, 12 nozzles.

CREAM AND PASTE FILLER—No. 130. Hand Operated. Up to 30 tubes or jars per min. Up to 1" x 5½" tube size, with single stroke.



TUBE FILLERS, AND CLOSERS, AUTOMATIC—Nos. 175; 180; 190. Up to 100 tubes per min., liquid to heavy paste.

TUBE AND JAR FILLERS, GEAR OR WORM, POWER DRIVEN — Nos. 110; 140; 150. Up to 50 fills per min. Up to 2"x11" tube size.



TUBE FILLER, CLOSER, & CRIMPER, LIQUID & PASTE—No. 113. Up to 40—6-Fl. Oz. fills per min.

TUBE CLOSER, HAND OPERATED—Nos. 440; 450. Up to 20 tubes per min., 2½"x10" max. size.

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DIVISION SNYDER TOOL & ENGINEERING COMPANY

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SPECIALISTS IN PHARMACEUTICAL AND FILLING MACHINERY FOR 70 YEARS

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which you are so proud this year could have been made last year if you were a little more on the beam. Every saving is relative to something else beyond the control of people in a particular category of a business. Production savings depend on sales volume; purchasing savings depend on production volume; marketing savings depend upon sales volume and sales volume often depends upon general economic conditions. (But I've never met a sales-manager yet who would admit that, excepting when volume declines.)

Lastly it is of no particular credit to a production man to reduce the cost of a particular product when the reduction is achieved in one period as against another, but when he can produce the same product cheaper than his most efficient competitor, then he can stand up and take a bow.

Management Organization

Management is divided into four groups: top management, comprising directors, officers and senior executives; middle management, comprising assistant superintendents, divisional sales managers, office managers; bottom management, comprising foremen and minor executives in every department and staff consultants, comprising attorneys, consulting engineers and chemists, auditors, tax and marketing experts.

The old theoretical idea was that the board of directors was a body apart, representing the stockholders and responsible for policy. It never really worked out that way especially in our industry where almost every board is a pot-pourri of inside and outside personnel. It has been my observation that where a board of directors is composed of top operating executives management is usually good because each of the directors knows what he is talking about especially in regard to the division of the business under his control.

It is a good thing to have on the board some staff members or outside consultants to keep management concepts and policies from becoming ingrown; to act as objective sounding boards for new ideas and plans and to act as referees when divisional heads start fighting as they so often do.

I have been at board meetings where not a soul was connected in any way with the business except the president of the company. They were all financiers and attorneys. Such a condition should be outlawed.

Every sizable company should have a board of trustees to represent stockholders and a board of directors to formulate policy and direct operations. The former could be composed of outside personnel entirely. It should meet annually and act as a court of review on the policies formulated by the operating board but only to the extent that such policies affect the financial interests of stockholders.

Thus all members of the board of directors would be directing officers or executives of the various divisions of the business. Such a board should meet monthly at least. A division like this at the top would eliminate the anomalous situation encountered in many companies where the top marketing and production executives are not members of the board. They are not allowed a voice in making policies they will be called upon to execute.

The burdens of top management have become so heavy, even in our own industry, that attempts have been made to divide the load by setting up a group or product manager system in imitation of the big motor companies and the big soap companies. Such a system can lead to a lot of internal combustion as the product managers play politics, and connive to have their products given preference. Some of the worst managerial set ups I have encountered were product manager systems.

The big soap companies like Lever Brothers and Proctor & Gamble can afford to have product manager set ups because almost everyone of their products is big enough to justify a separate marketing organization, separate advertising programs, separate administrative set ups and even separate plants. The same condition prevails in the motor industry where divisions are set up as separate companies and compete fiercely with each other.

Isn't this clear recognition that big companies eventually become unwieldy and inefficient and that the small company even if it is only a division is more economical to operate and more efficient in everything?

But the product manager system is dangerous when all products are made in the same plant and all business affairs are administered from the same office. A certain amount of rivalry between divisions is good provided Mr. Bigboss has his hand tightly on the control reins.

New Patterson-Kelley Catalog

A new catalog on blending, processing, and heat exchange equipment for the chemical and processing industries has been issued by the Patterson-Kelley Co., Inc., East Stroudsburg, Pennsylvania.

Available free on request, Bulletin 13 provides photos and specifications on a variety of sizes and adaptations to P-K's three basic types of blenders. Production sizes are available on the ribbon, double cone, and patented twin shell models, and one pint to eight quart laboratory sizes for the twin shell.

Twenty different cooling and heat exchange units are shown, with many devoted to specialized applications.

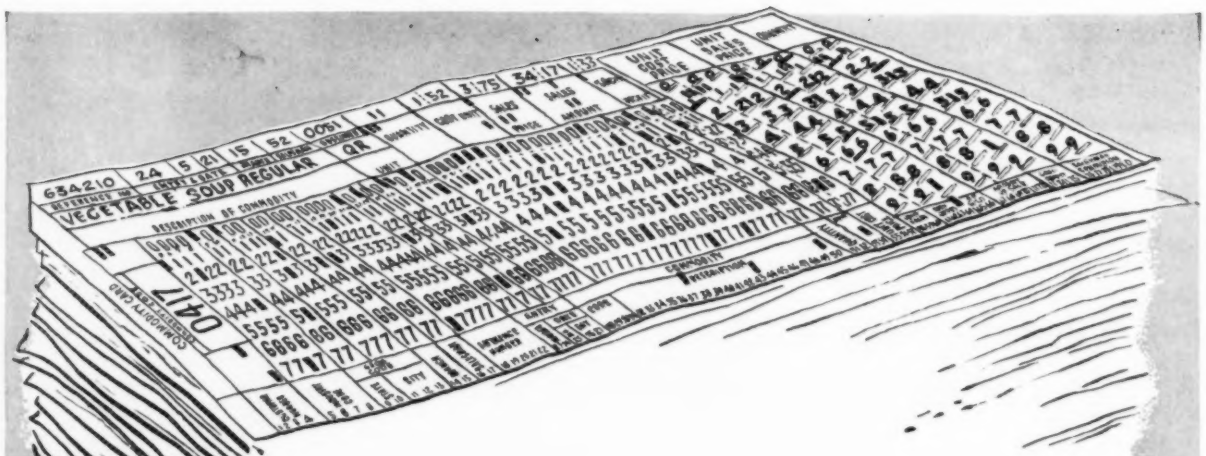
Carton Stapler

"In reading your trade paper in past years, we note this publication is always first in its field to describe new equipment of merit.

"Ordinary methods of carton closure add nothing but cost to the products of the drug and cosmetic industry.

"With nearly a quarter century dedicated to reducing carton closure costs, the long awaited Schafroth Advance Design in pneumatic staplers is proudly announced:

"Model P A (Portable Air) $175.00 F.O.B. Herrin, Ill.



What happened to these punched cards shouldn't happen to a process...

On humid days paper becomes limp. It expands and, in the case of punched cards, may jam machinery. Instant coffee can absorb humidity enough to jam packaging machines. Sugar and powders gum up and are unworkable. Any number of processes bog down when humidity is high.

Materials that readily absorb humidity and retain moisture are hygroscopic. They can give you trouble on a "wet day" unless you extract humidity from the air around them. Lectrodryers are doing this in many industries every day . . . making processes workable in any kind of weather.

10% relative humidity isn't uncommon with these machines. They can handle air in sufficient volumes to dry an entire warehouse.

If humid days frequently delay or stop your processes, inquire about Lectrodryers. Write for the booklet *Because Moisture Isn't Pink*. It describes the many ways industries are using Lectrodryers. Pittsburgh Lectrodryer Corporation, 309 32nd St., Pittsburgh 30, Pennsylvania.

In England: Birlec, Limited, Tyburn Road, Erdington, Birmingham.
In France: Stein et Roubaix, 24 Rue Erlanger, Paris XVI.
In Belgium: S. A. Belge Stein et Roubaix, 320 Rue du Moulin, Bressoux-Liege.

LECTRODRYERS DRY WITH ACTIVATED ALUMINAS

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REGISTERED TRADEMARK U S. PAT OFF.

"This machine was invented by Mr. Werner Schafroth, President of our Company, and the United States Patent Office issued Letters Patent No. 2,680,845 covering same on June 15, 1954."

Lab Scale

A new precision laboratory scale has been announced by Ohaus Scale Corp., Union, N. J. The highly accurate triple beam scale incorporated several of the latest developments in scale design.

The triple beam section is made of anodized duraluminum for strength and light weight. Precision ground, hardened knife edge mountings riding on self aligning polished agate bearing blocks assure greater sensitivity and longer service life by reducing friction to an absolute minimum. Specially designed dust covers prevent the ingress of dust.

The rugged, die cast frame of the scale has an integral spirit level and adjustable leveling screws. A new type fluted, corrosion-proof plastic handle, extruded by Anchor Plastics Co., Long Island City, and placed at the approximate center of gravity of the scale makes it easy and safe to move the scale about the laboratory.

Stainless steel bows and pans, self storing attachment weights and rapid action balance arrests are other built-in conveniences which the laboratory worker will appreciate.

Specifications for the scale are as follows:

Capacity:	311 gr.
Sensitivity:	0.01 gr.
Beam Calibration:	Front: 1 gr. x .01 gr.
	Center: 100 gr. x 10 gr.
	Rear: 10 gr. x 1 gr.
Attachments Weights:	2 x 100 gr.

Universal-Interferometer

In this newly developed Interferometer, there has been constructed an instrument adapted for testing the planeness of polished surfaces by means of Fizeau fringes, for determination of the radius of curvature of slightly spherical surfaces by means of Newton rings, for determination of the wedge angle of slightly wedged transparent plates by means of Fizeau fringes as well as for plane parallelity investigations on transparent plates by means of Haidinger rings. It also lends itself for comparison measurements on end gauges.

The principal advantage of the instrument lies in its optical arrangement which reproduces interference images completely free from reflection. Moreover, these images excel by their great sharpness and freedom from distortion owing to the installation of specially corrected lenses in the illumination and observation paths of ray.

Surfaces up to 140 mm (5½") can be tested for planeness.

Measuring radii of curvature up to 100 km (60 miles) of optical surfaces (glass, silvered glass, metal, etc.)

Plane-parallelity test on plates up to 140 mm (5½").

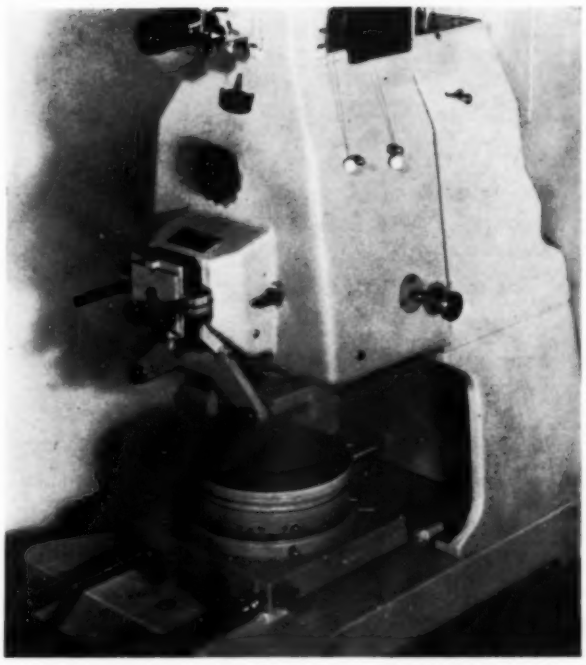
Comparison of gauge blocks with plus/minus 0, 05 u accuracy for gauges up to 140 mm in length (5½").

Surface testing and other micro-interferometric examinations.

Interferometric measurement of any precision parts by means of interference tracer.

Shape testing of interior and exterior surfaces.

For further details write: Wm. J. Hacker & Co., Inc., Beaver Street, New York 5, N. Y.



New Waste Disposal Plant

Operation of a new waste disposal plant at the Langdon Farm Road manufacturing site of the Hilton-Davis Chemical Company has been "very satisfactory in all respects" since its recent installation as part of the firm's anti-pollution program, it is reported by James F. Thompson, general manager.

The waste disposal plant was constructed in conformity with an eight-state agreement, reached in 1949, looking toward reducing pollution of the Ohio River. To carry out this objective, the Ohio River Valley Water Sanitation Commission was created to study the problem posed by contamination of the region's waterways and to coordinate the remedial action taken. Cooperating in the project are the states of Ohio, Illinois, Indiana, Kentucky, Virginia, West Virginia, Pennsylvania and New York, as well as many municipal governments and industries.

In 1953, Cincinnati passed an ordinance specifying the requirements for making industrial waste products acceptable for treatment in the city sewage plant. Hilton-Davis completed installation of its waste disposal plant, designed to meet the specifications of the ordinance, on July 19 of this year.

"Hilton-Davis has naturally cooperated wholeheartedly with this anti-pollution campaign from the very start, and we are gratified with the very satisfac-

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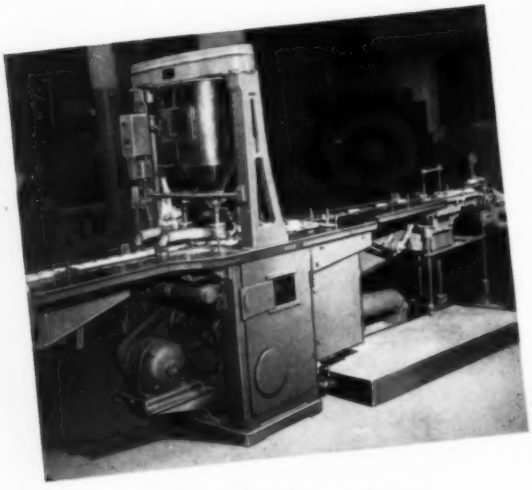
MODERN FILLING MACHINES



View of the S & S HG-84 Automatic Heavy Duty Duplex Filler at Avon Products, Incorporated, *Suffern, New York*

Whatever your product, profits begin with accurate filling. You can maintain this vital accuracy in your operations with S & S Filling equipment. There is an S & S Filler for most every product; paste, granular substance or powder. Prompt attention will be given to your request for complete information.

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tory results obtained since our waste disposal plant went into operation," Mr. Thompson stated.

He listed five separate functions performed by the new equipment. It controls, within very narrow limits, the alkalinity and acidity of the effluent leaving the Hilton-Davis plant; refines the waste to meet specifications issued by city authorities; reduces the solids; completely removes certain metals harmful to stream life; and eliminates strongly-colored waste.

In operation, the waste disposal plant collects all effluent at a central point, including rain water from building roofs and roadways on the firm's 78 acres, and forces these wastes by acid-proof pumps into a primary basin. The conveyance used is a wooden pipe line, 12 inches in diameter and approximately one-quarter of a mile long.

This main basin has a capacity of 10,000,000 gallons, equivalent to the effluent discharged in ten days' manufacturing operations at Hilton-Davis. Alkaline and acid wastes are mixed in this basin until they neutralize each other, and the colored wastes are destroyed by interacting and precipitating. Now all waste leaving the plant to enter the city sewers is a mint-tea color.

The preservation of stream life is a fundamental part of the anti-pollution drive. Aquatic life depends for existence upon oxygen dissolved in the water. Untreated waste products dumped into waterways use up the oxygen and compete with aquatic life for the remaining oxygen. These oxygen-absorbing substances are largely removed in Hilton-Davis' new waste disposal plant.

As the effluent passes from the main basin to either of two 3,000,000-gallon lagoons, any remaining acidity is automatically neutralized by special electronic equipment which feeds lime, as needed. In addition, solids might clog the sewers or interfere with stream life, settle on the bottom of the basin and are removed here. The clear, neutral effluent then proceeds to the city sewers.

At this point, samples are continually taken by a pump that forces them back to the control house at the discharge end of the basin. A record is charted there of the acidity or alkalinity of the waste as it leaves the last basin.

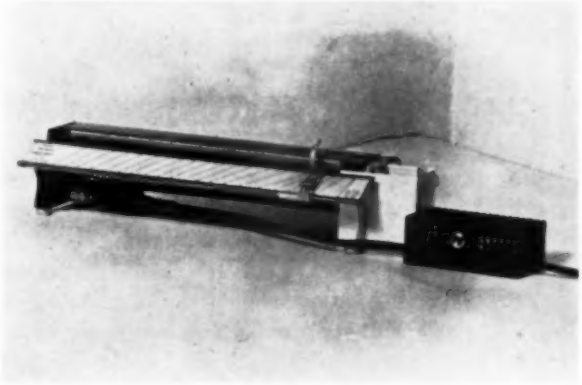
Additional equipment installed by Hilton-Davis includes numerous separators which remove materials that might develop objectionable odors if permitted to reach the disposal basins. The materials thus collected are burned slowly in furnaces, effectively preventing odors.

Chester H. Allen, director of public relations and safety, supervises all waste disposal operations at Hilton-Davis. Donald A. Brown, a graduate chemical engineer, is in charge of the waste disposal plant which requires round - the - clock attention from three employees.

Melting Point Apparatus

William J. Hacker & Co., Inc. announce the availability of the Kofler Hot Benches, said to require but a few seconds to determine melting points. Developed primarily to determine melting points and eutectic temperatures of organic substances, the Kofler Hot Benches also provide a rapid method to observe the presence and behavior of water crystal, the process of decomposition and to judge volatility.

The instrument consists of a metal body and an electrically heated element that provides an almost linear temperature drop. The Kofler Hot Benches have a temperature range from 10° to 260° C. To determine a melting point, the substance is laid on the chrome-plated surface of the pre-heated Hot Bench. Within a few seconds, there is a sharp dividing line between the solid and liquid part of the substance. A runner is moved until the point rests on the dividing line and the temperature is read from the scale of the instrument.



Test substances of known melting point are provided to gauge the instrument. The Hot Benches have an accuracy of plus/minus one degree centigrade.

For further details please write Wm. J. Hacker & Co., Inc., 82 Beaver St., New York 5, N. Y.

Round Bottle Labeler

New Jersey Machine Corporation, Hoboken, N. J., announces its new automatic labeler for round bottles — the JOWE.

This unit will be made in Germany by Johann Weiss of Berlin, and will include the suction principle of label handling which is the trademark of all New Jersey Machine labeling equipment.

The JOWE has a capacity of 165 bottles/minute, uses glue, employs constant motion principles of operation, and is complete with a rotary discharge accumulator table.

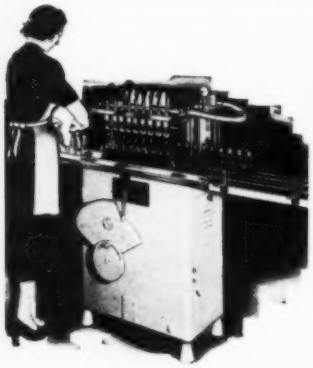
Mr. Richard Wellbrock, Vice President in Charge of Sales for New Jersey Machine Corporation states, "We are proud to add the JOWE to our line of labeling machinery, and to make the speed and precision workmanship of German-made products available to the American labeling machine market at low cost. We are assisted in this effort by Pan American Supply Co., New York City, who will be our personal representative to Germany so that we can constantly communicate first-hand. We consider this an essential link in providing the high type service to which the American labeling machine user is accustomed. Uninterrupted

The MULTI-U-METER Handles Plastic, Odd-shaped Containers

Container guides hold any type, shape or size containers rigidly in filling position. Handles any liquid. Has automatic product supply and automatic filling control. Advanced features. Minimum floor space. Two-Head and Four-Head models. Write for Multi-U-Meter Bulletin.

Look to US for Every Liquid Filling Requirement

You can get better production from fillers that simplify operations. For decades, U. S. engineering has consistently improved automatic machine operations to reduce manual dexterity. Result: greater and easier production. As a policy, every moving part is built for dependability-plus. That is why U. S. machines have that "never-let-you-down" reputation which you can depend upon. Whatever your liquid filling requirements, investigate U. S. machines.



Model B-49 Straightline Vacuum Filler handles any liquids. Quick changeover for all container sizes (AGST to gallons). For operation with or without discharge conveyor. Simple hand lever operation for multiple filling of up to 9 containers at a time, otherwise completely automatic. Filling is uniform, clean and fast. Write for Bulletin B-49.

• • •

Model B-2 Vacuum Filler handles any liquids; all containers ranging from AGST finishes to containers 4½" dia. Four container holding cups enable continuous filling of two containers at a time. Product supply is automatic. Portable. Ideal standby for peak loads. Write for Bulletin B-2.

• • •

Siphon Filler efficiently handles free-flowing liquids. For all container sizes including gallons. Stainless steel, no drip siphon tubes. Write for Siphon Bulletin.

Model B-2

U. S. BOTTLERS MACHINERY COMPANY

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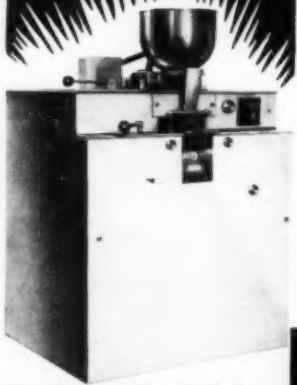
NEW Low Cost FORMAPAK forms, fills and seals with a SINGLE OPERATOR



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- Strong seal
- Wide range of packet sizes
- Speeds up to 100 packets per minute

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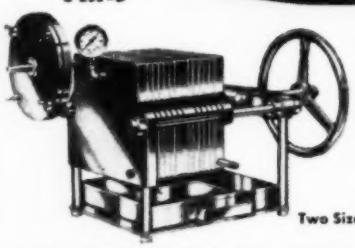
West Coast Rep: Peter D. Bowley & Assoc., 210 Mississippi St., San Francisco, California

NEW ERTEL PYROGEN & BACTERIAL RETENTIVE FILTERS

MODEL 8 ESS-D



- PROVIDES FOR DOUBLE FILTRATION
- EASY TO SET UP
- EASY TO CLEAN
- PRECISION MACHINED
- NO WASHERS
- COMPACT & PORTABLE

Two Sizes: 8 Inch and 4 Inch Square

This most versatile unit is available for either double or single filtration. Double filtration is recommended for critical pyrogen and bacterial retentive work. Available in highly polished stainless steel; can also be furnished in Lucite construction. Lucite is only recommended for applications below 120° F. Compact size makes ESS Models ideal for laboratory or small production use. Model 8 ESS-D accomodates 8" square Ertel Asbestos Filter Sheets, whereas Model 4 ESS-D accomodates 4" square sheets.

Write for illustrated bulletin 8-4 EL

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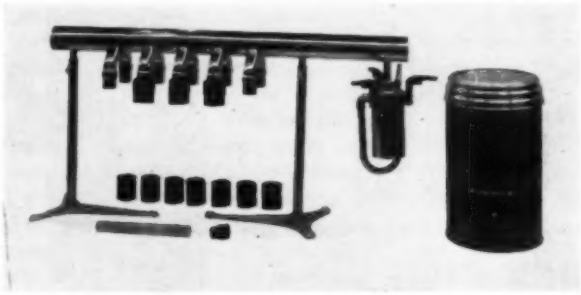
production is further assured by the fact that each machine will be shipped with a set of spare parts. This is becoming a smaller world in which we must cooperate with other nations, and it's a smaller world in which machine parts are available by air in 24 hours."

Tissue Freezer

An inexpensive unit for preserving human tissues, particularly arteries for grafting, which can be deposited in "tissue banks" in readiness for immediate use in cases of emergency, has just been developed by F. J. Stokes Machine Company, Philadelphia, Pa. The new tissue preserver has been designed especially for use by small hospitals and laboratories. Standard components from other Stokes freeze-drying equipment have been utilized in its construction to keep its cost to a minimum.

Basically, the unit consists of a compact, self-contained vacuum pumping system, an evacuation manifold with 10 ports to which the Pyrex tissue containers are connected, and a condenser. The tissue, in con-



tainers, is first frozen in normal atmosphere, either in a deep-freeze unit or by surrounding the specimen with dry ice. The container is then attached to one of the ports of the manifold, and evacuation begins. If desired for sterilization, ethylene oxide may be admitted through the vacuum break and into the manifold. This technique was developed at the U. S. Navy's Tissue Bank at Bethesda, Maryland.

Pressure is brought down to the range from .01 to .05 millimeters and maintained at that level for 72 hours. An ice water slush bath in a tray is placed around the tissue container during the early stages of drying. The temperature differential between this bath and the condenser acts as relative heat to complete the drying of the tissue.

Moisture removed from the tissue is trapped by the condenser, which is kept at a temperature of approximately − 78 deg. C. by immersing it in a bath of dry ice suspended in methyl cellosolve, which has a suitably low melting-point and viscosity, a relatively high flash-point, no offensive odor or known health hazard, and is reasonable in cost.

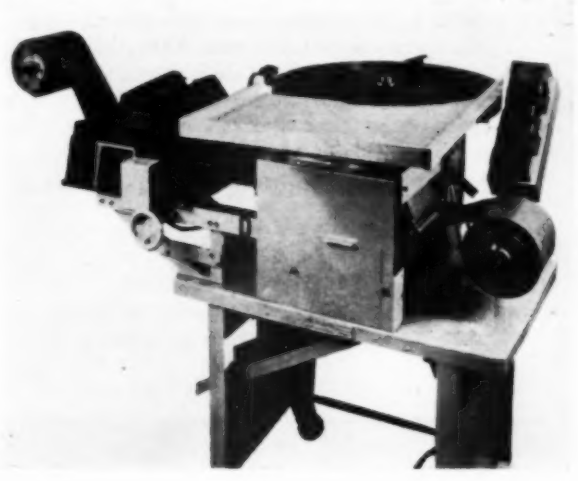
When the tissue is thoroughly dried, vacuum is broken in the manifold by the introduction of dry nitrogen through a tee connection in the vacuum line. This prevents oxidation of the tissue or re-absorption of moisture. Sleeve stoppers made of a special lubricated natural gum rubber are quickly inserted into the tissue containers as they are removed from the manifold ports. A syringe needle attached to a flexible tube connected to the vacuum pump is inserted into these stoppers to remove the nitrogen from the containers for storage. When the needle is withdrawn, the thin membrane of the stopper will reseal itself. A coating of Glyptal or other cement is usually added, however, as a further precaution.

Can Capper

The new Elgin Model "S" High Speed Cap Dropper and Capper automatically places double or triple friction plugs on cans and then securely seals the plugs in the cans. Unusually compact and with minimum space requirement, the Model "S" is designed for easy coupling with any type filler. This new Elgin equipment was developed to accommodate long or frequent short runs in all sizes from one thirty-second to and including gallons.

Packaging Machine

The Auto-Pak, a low cost, versatile packaging machine that produces automatically a flexible package with quality seals has recently been improved to handle a wider range of heavy gauge commercial packages and meet rigid specifications on special materials. The unit, developed by Pak-Rapid, Inc., 530 N. 21st Street, Phila. 30, Pa. packages a wide range of consumer and industrial items of many different sizes and shapes. It is easily installed by plugging in to any ordinary line capable of handling 30 amp and automatically forms two sheets of material around the items to be packaged, seals the four sides, cuts off and delivers a completely sealed attractive package, as many as one every second. The Company states that the Auto-Pak will make a heat sealed package using special materials such as 50 lb. wet strength, creped-kraft coated with 5 mils polyethylene. In addition, a variety of special attachments are available with the Auto-Pak for automatic feeding, counting, coding and printing. Change-over to different size packages and attachments is quicky and easily made. For additional details, write Pak-Rapid, Inc., 530 N. 21st Street, Phila. 30, Pa.



Deodorants with G-11®

(Brand of Hexachlorophene)

remove the cause of body odor

Soaps, detergents, creams, colognes, sticks and lotions containing G-11 are making dramatic sales increases because they combat the fundamental cause of body odor.

Body odor, particularly underarm odor, is caused by the action of skin bacteria on perspiration. Research has shown fresh perspiration to be odorless until it is contaminated with skin bacteria. G-11 combats these bacteria and thus removes the basic cause of the odor.

G-11 remains on the skin, even from soaps which are thoroughly rinsed off with water. Thus the deodorant action persists for days. Persons who have used deodorants with G-11 for three and four years show no immunity to their action.

Over seventy scientific articles, mostly by independent researchers, have been published over the last ten years attesting to the antibacterial and deodorant performance of G-11.

In addition, G-11 is not perceptible while on the skin, has no harmful effect on clothing, is compatible with perfumes, is readily soluble in soaps and cosmetic formulations, and is non-staining and non-irritating.

Write now for technical bulletins and formulas for G-11.

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Advancing Therapy

Calcium Hydroxide for Dental Pulp Capping

H. F. Sawyer and W. J. Amaral (*N. S. Armed Forces Med. J.* 5:1155, 1954) report that in the management of carious teeth with pulps exposed, a high degree of success was obtained following pulp capping with calcium hydroxide. The patients treated were young adults, between the ages of 19 and 23 years with an average age of 20.03 years. Of 225 teeth treated with calcium hydroxide as a pulp capping material, 52 were available for clinical and radiographic observation for from 30 to 120 days. As an aid in control and evaluation, only oxyphosphate of zinc cement was used as a filling or filling base in these teeth, and no sterilizing drugs, zinc oxide, or eugenol were used in treatment. Of the 52 teeth treated, the results in 50 were considered to be clinically successful; two teeth gave radiographic evidence of a periapical abscess. Although the prognosis was undetermined or poor in 25 teeth the results in all but one were clinically successful; the second failure occurred in a tooth with a good prognosis.

These findings indicate that the use of sterilizing drugs, zinc oxide, and eugenol is not essential in the treatment of exposed pulp, and that the use of calcium hydroxide is adequate, resulting in rapid healing of pulpal tissue in the young tooth.

Benzoin Tincture as a Protective Coating

It is noted by M. Naide (*J.A.M.A.* 155:746, 1954) that the chief problem in managing patients with severe ischemia of the foot is the prevention of gangrene and amputation. Because of the constant presence of the problem of the ischemic extremity with fragile skin that is on the verge of cracking or breaking down, the need for a substance that would protect the skin is evident. The lack of an adequate method of protecting the skin of a patient with ischemia has been a major defect in the program of prevention of gangrene and amputation. In the search for a coating material that would be easy to apply and protect the skin, compound tincture of benzoin proved to be the most useful. At first the U.S.P. product was used, but as use of this preparation was continued it was found that compound tincture of benzoin as ordinarily made up was too dilute and left too thin a coating. It was found that if one took compound tincture of benzoin as ordinarily made up and evaporated the alcohol until one-half of the original volume was left, one obtained a more concentrated preparation that proved much more useful as a protective coating.

Naide states that 120 patients with severe ischemia of the feet have required the use of compound tincture of benzoin as a protective coating during a period of two years. He concedes that it is difficult to estimate how many months of hospitalization and how many extremities were saved by this simple protective measure. Nevertheless, gangrene was prevented in many patients and some extremities were saved as the result of preventing the initial break in the skin without which gangrene will usually not start. Thus far, no sensitivity to this drug has been seen in the 120 patients who were treated.

Repository Penicillin in Rheumatic Fever Prophylaxis

A new approach to the problem of prevention of recurrent attacks of rheumatic fever is indicated in the report of A. M. Diehl, T. R. Hamilton, I. C. Keeling and J. S. May (*J.A.M.A.* 155: 1466, 1954). As a prophylactic measure, 96 children, who had previously had or did have active rheumatic fever, were maintained for as long as 14 months with a long-acting form of repository penicillin, benzathine penicillin G (Bicillin), 1,200,000 units administered every four weeks. Of 1,045 cultures that were taken after benzathine penicillin prophylaxis was instituted, 40, or 3.8 per cent, showed the presence of beta hemolytic streptococci, of which only four have been proved to be of Lancefield group A. In the outpatients with inactive rheumatic fever who were given benzathine penicillin for seven months, there was only one positive culture. There were only two significant rises in the antistreptolysin O titer during prophylaxis, and with one of these, the preceding throat culture was positive. No clinical recurrences of rheumatic fever were observed in patients whose rheumatic activity was quiescent when prophylaxis was instituted.

The investigators are of the opinion that until the exact cause and the details of pathogenesis of rheumatic fever have been elucidated, the direct attack on the beta hemolytic streptococcus of Lancefield group A, seems to be the most logical approach to the prevention of recurrent bouts of rheumatic fever. The introduction of benzathine penicillin into the medical armamentarium offers an agent that may prove most effective in maintaining the individual patient under observation and reliable management by monthly injections. A program of continuous prophylaxis to stave off intercurrent streptococcic disease appears thus far to be the best available method for the prevention of recurrent attacks of rheumatic fever.

Fumagillin in Amebiasis

In reporting on his experiences with the use of the antibiotic, fumagillin, in the treatment of 82 cases of intestinal amebiasis, E. L. MacQuiddy (*Antibiotics & Chemother.* 4:178, 1954) states that 60 of this series had been treated previously with other drugs. Proper dosage was established after several trials. The bulk of the report dealing with the administration of 10 mg. capsules of fumagillin twice daily for a period of 10 days. As the dose was reduced, the number of reactions decreased in number and severity. Even with this reduced dosage patients may have mild abdominal cramps, some looseness of the stool, and occasionally a mild vesicular rash. Most of the patients have noted improvement shortly after the beginning of fumagillin. Others did not notice any improvement until the cessation of the drug. There were some patients who required further medication. MacQuiddy has been able to complete 90-day follow-ups on 32 patients treated in this series. Twenty-nine of the 32 patients showed stools negative for amoeba. Whenever possible, he has

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checked the urine, blood, and blood pressure on the patients returning, and in none of the cases was anything found to indicate damage to the hemopoietic system or the urinary system. It is this investigator's opinion that fumagillin is a specific drug and that additional therapy is necessary in some cases because of the possibility of mixed infections. Those patients not obtaining complete relief with fumagillin have usually obtained relief when fumagillin was followed by one of the insoluble sulfas.

Chlorpromazine in Vomiting of Uremia

Chlorpromazine, says D. S. Friend and J. F. Cummins (*New England J. Med.* 250:997, 1954), a recently develloped chlorinated phenothiazine (Thorazine), in doses of 25 to 50 mg. four times a day, was found to be effective in suppressing nausea and vomiting in 13 of 14 cases of severe uremia. The beneficial effect of chlorpromazine was striking. Patients who had been depressed and anorexic, with nausea and vomiting, for days were relieved in two or three hours. Frequently, they ate their next meal—for some the first in two or three days. Usually, improvement in general condition resulted promptly. They became more cheerful, relaxed and physically stronger. With the disappearance of the nausea and vomiting management became much easier, and the electrolyte balance more stable. Some patients were maintained for weeks nearly free from any nausea or vomiting, although there were severe electrolyte disturbances.

Drowsiness occurred in approximately 50 per cent of the patients. In no case was it necessary to discontinue the drug because of this effect. Pruritus was frequently relieved. In this regard, chlorpromazine behaved like compounds of the antihistaminic series. It is apparent that elimination of the drug is not dependent on the kidney since there was no observable difference in degree of effect or dose required between patients with slight or no renal impairment and those with complete anuria.

Corticotropin for Severe Asthma

As noted by K. Ball (*Lancet* 1:1162, 1954) there have been several favorable reports of the treatment of asthma with corticotropin and cortisone; but the results of any new treatment of asthma are notoriously difficult to assess. For this reason a controlled trial of corticotropin was made in patients with severe chronic asthma which has not responded to any other forms of treatment. In Ball's investigation, 13 patients with severe chronic asthma were given either corticotropin or saline solution by injection for twelve days. No one in charge of the patients knew which substance was being given. Of the six patients receiving corticotropin five showed moderate or much improvement, compared with two out of seven patients receiving saline solution. Much improvement took place in three of seven patients with status asthmaticus treated with corticotropin. Twelve patients with severe asthma were maintained on corticotropin with satisfactory results. Usually their asthma became mild.

It is pointed out that death is likely in patients who have repeated attacks of status asthmaticus. Corticotropin (or alternatively cortisone) should be made available for all such cases.

Lysine in Infant Diets

In their report to the Division of Biological chemistry during the 126th national meeting of the American Chemical Society, A. A. Albanese, R. A. Higgons, G. M. Hyde and L. Orto stated that the rate of growth of infants, especially those with poor appetites, has been substantially improved by small additional amounts of the essential amino acid, lysine, in a typical diet. The amino acid not only improved growth but also raised the hemoglobin and plasma protein contents of the blood and, in some cases, improved appetite. It was pointed out that the lysine requirements for infants are twice those of normal young adults. Chemical analysis showed that typical feeding formulas, containing adequate proteins, vitamins and minerals, were short of the ideal amount of easily-digested lysine.

Observations were made on 15 infants, aged one to 27 months, for periods varying from nine to 21 weeks. These children were fed standard fresh or evaporated milk formulas with supplementary foods, in accord with prevailing pediatric practice. The vitamin and mineral content of the diet was as high as, or higher than, the recommended levels. Extra lysine was added to the formulas for three to four weeks in about the middle of the observation period for each child. For comparison, another group of nine infants received a similar diet, but without the added lysine. This investigation showed that of the 15 infants, the body weight and nitrogen balance of five were markedly improved by the addition of lysine to the diet. The infants in this group ranged in age from six to 26 months and were generally of poor appetities. In every instance, prior to determining the effect of lysine supplements, improved nutrition was attempted by increasing the protein content of the diet. In most infants, the increased protein intake caused a transient increase in weight gain and nitrogen balance, which was soon followed by decreases of greater magnitude in appetite and body weight.

Emphasizing that the lysine-fortified diets were effective only with children who were not getting adequate nourishment from their food, it was pointed out that four of the 15 infants showed no observable improvement when lysine was added to their diet. The growth rate of these children was already well above average. The remaining six children in the experimental group showed no spectacular weight gains during the period of supplemental lysine feeding, but significant and definite biochemical changes occurred. Urinalyses showed that more nitrogen was retained in the body tissues than before the lysine was added. This is a sign that the children gained in strength and sturdiness. It was also found that protein levels in the blood increased at the same time.

Ammoidin-Ammidin Solution for Alopecia

A solution consisting of 7.5 mg. of ammoidin and 3.75 mg. of ammidin per milliliter in isopropyl alcohol was used by L. E. Savett (*Arch. Dermat. & Syph.* 70:235, 1954) on three patients with alopecia areata in an attempt to cause regrowth of hair. Some of the areas of baldness of each patient were treated by light applications of this solution once each week and, as controls, other areas in each patient were treated with concentrated phenol followed by neutralization with isopropyl alcohol. All areas were irradiated with cold quartz light. In addition, an intramuscular injection containing folic acid, vitamin B_{12} and crude liver was administered weekly. From preliminary observations with this treatment, it is Savitt's impression that the application of an ammoidin-ammidin solution causes regrowth of hair more rapidly than the commonly used phenol-alcohol solution, without even the mild discomfort to the patient produced by the latter preparation. However, it will be necessary to observe the results of treatment of many more patients with this preparation before final conclusions can be reached.

THE SUNTAN INDUSTRY

(*Continued from page 772*)

compounds tolerable in a commercial suntan product. We have previously disclosed the numerous influences and conditions which can facilitate the transformation of a benign chemical to one capable of precipitating dermatologic pathology of considerable magnitude. Every milligram of active material above the irreducible minimum, no matter how harmless its reputation, additively and directly potentiates the risks of untoward cutaneous repercussions.

Pharmacologic Inertness and Photo-Stability

Pharmacologic or systemic activity should be thoroughly explored. For example, quinine is nearly always included in sunscreen recommendations although it is of negligible value. While this drug is not, strictly speaking, a poison, applied over large areas for sustained periods, as it would be in a sunburn preventive, the absorption of quinine with systemic effects is an unquestioned possibility. This phenomenon is not of serious consequence with the above drug, but there have appeared a number of new screens of an extremely complex nature which, judging from their structure and formula, might if absorbed exhibit sinister pharmacologic properties. Before reflecting upon any new chemical for use in suntan preparations, an absolute guarantee of pharmacologic inertia should be assured.

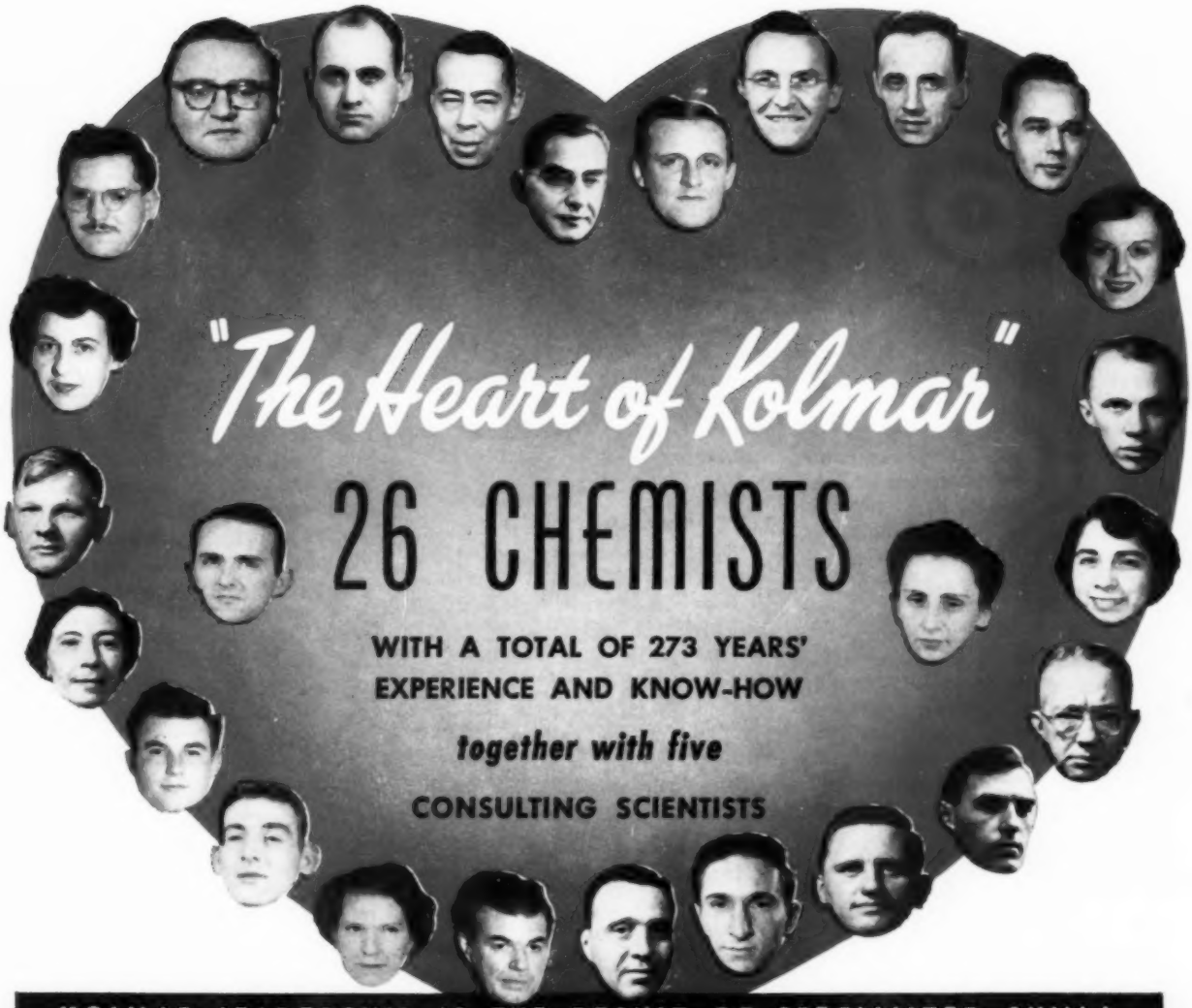
Photo-stability is an essential not amenable to compromise. The catalytic potency of the combined effects of infra-red, visible and ultra-violet rays is enormous and very few compounds can withstand such an assault for unlimited periods. Inasmuch as the average daily exposure has been estimated at about four hours, sunscreens must be able to resist chemical change for at least this period, and preferably longer. Photo-stability and photo-liability should be ascertained by direct investigation rather than dependence upon technical press reports. The basis for this caution will become apparent from the following: according to Rothman and Heningsen[24] tannic acid is so unstable it decomposes while making spectrographic measurements. Christensen and Giese[25] claim that tannic acid is not only stable but actually showed a slight rise in ultra-violet absorption during irradiation. This irreconcilable divergence brings into view the fact that spectrographic data can be extremely misleading since one of these workers is in gross error. In any event tannic acid is a poor screen and although it enjoyed some popularity, its performance was never satisfactory. Incidently the largest selling suntan lotion in America still contains tannic acid as one of the formula components.

Christensen and Giese[25] describe the behavior of ethyl-para-amino-benzoate when irradiated with a G.E. Sunlamp. After two hours there occurred a marked increase in the absorption of erythemogenic wavelengths, and after eleven hours, a slight drop took place. Loss of efficiency after eleven hours is purely academic since in actual beach use, exposures of this length are a remote possibility. The low photo-sensitivity or stability of ethylpara-aminobenzoate is substantiated by Hammarlund[26] who asserts that this compound when exposed to the radiation of a Bricker mercury arc lamp for twenty minutes at thirty inches, showed no loss in filtration properties. This irradiation is claimed to be equivalent to three hours of direct midday summer sunlight. In the commencement of a sunscreen study, solar stability should be one of the first attributes resolved. A simple technique to accomplish same is to place a solution of the product being analyzed in a covered quartz petri dish of proper dimensions. The concentration of the solution should be identical with that contemplated for distribution. The fluid in the dish should not be more than 1/8 inch deep and securely covered in order that the vehicle will not be lost by evaporation. Expose to direct sunlight for four hours throughout the peak intensity time of the day during the summer. Subsequent examination if spectrographic, should be confirmed with erythemal tests. If a compound successfully resists deterioration during 240 minutes of solar irradiation, stability requirements will have been adequate. If a marked or even a slight declivity is noted, the chemical in question had best be discarded.

Sunscreen Solubility

The matter of solubility is of appreciable importance. A screen that is freely water soluble will definitely be diluted and displaced by perspiration and immersion. Reasonable tenacity is a necessary function inasmuch as suntan lotions are continually subject to removal by solvent action while bathing. Unless reapplication is immediately made, the sunbather will be unprotected if the sunburn preventive used contains a screen that is too freely water soluble. Dilution by solubility in perspiration reduces the concentration of the screen resulting in a substantial reduction in ultra-violet absorption. In either event, i.e., displacement by bathing or dilution by perspiration, the over-all effectiveness of a suntan lotion will materially be lessened by excess solubility. There should be no fear of immoderate tenacity. With perhaps the exception of the silicones, soap and water with a little scrubbing will remove practically any suntan film from the skin. The ideal solubility of a sunscreen is one which permits a two to five per cent solution in a fifty per cent hydro-alcoholic vehicle. Reduction of the alcoholic content to thirty-three per cent should cause precipitation. This seems to provide the correct degree of adherence of the deposited film and resists displacement and dilution. If still greater adhesion and resistance to displacement is desired, the addition of certain new silicones offers a perfect means of attaining such objective. These polysiloxanes are cheap, dermatologically inert, and have the unique faculty of forming extremely adherent films on the skin, plus the added virtue of being totally in-

(*Continued on page 830*)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Compounder's Corner

Improved Calamine Lotion

It is pointed out by P. J. Pantle, P. E. Perrins, M. M. Wieand and O. N. Martin (*J. A. Ph. A.*, Pract. Ed. 15: 418, 1954) that a number of formulas for calamine lotion, proposed to replace the product now official, have been tested and evaluated. A satisfactory lotion requires the presence of a wetting agent in addition to the suspending agent to produce optimum properties of spread and covering as well as stability of the suspension. Dispersing agents may also be valuable in promoting stability.

In the studies reported by Pantle and his colleagues, the following formula showed the most acceptable properties and is recommended for further study and consideration.

Sodium carboxymethyl cellulose, type 70, medium viscosity	**2.0 per cent**
Polyoxyethylene sorbitan monolaurate (Tween 20)	**0.5 " "**
Zinc oxide	**8.0 " "**
Calamine	**8.0 " "**
Glycerine	**3.0 " "**
Water, to make	**100.0 " "**

Pearls as Cosmetic Raw Materials

That pearls may serve as raw materials for toilet goods is suggested by M. Takahashi in Japanese patent 4750 (through *Chem. Abstr.* 48:336, 1954). According to the patent specifications, pearl scraps or the pearl layers of pearl oyster shells are dissolved in hydrochloric acid. The acid is removed and the residue, at a pH of 4.5 to 5.0, is kept overnight. The solution is then treated with hot alcoholic mercuric chloride and an aqueous solution of ammonium stearate to precipitate a complex salt of mercury with decomposed pearl protein with stearic acid at a pH of 7.0 to 7.5. The salt has antiseptic and astringent properties.

Washable Hand Lotion

The following formula for a washable hand lotion is given in *The Bulletin of the American Society of Hospital Pharmacists* (11:131, 1954):

Stearic acid triple pressed	**70.0 Gm.**
Lanolin	**5.0 Gm.**
Sorbitan mono-oleate (Span 80)	**5.0 cc.**
Polyoxyethylene sorbitan monostearate (Tween 60)	**25.0 cc.**
Water	**845.0 cc.**
Glycerine	**50.0 cc.**
Preservative and perfume	**sufficient**

Mix the Span, Tween, and water and heat to 90° C. Dissolve the preservative in the glycerine and heat to 95° C. Add the Span and Tween solution to the glycerine solution while stirring rapidly. Continue to stir until the mixture has cooled to 30° C., adding the perfume when the temperature has reached 50° C.

Hormone Cosmetics

In a review of published reports on the use of estrogenic hormones for cosmetic purposes, S. M. Peck and E. G. Klarmann (*Practitioner* 173:159, 1954) state that it is the consensus among experienced observers that hormone creams with a maximum potency of 10,000 i.u. per ounce, if used in the manner recommended by the informed manufacturers, are free from systemic effects. They also find it established that, to date, there has been no evidence of precancerous or cancerous changes in the skin as the result of using such preparations over a period of several years. In studies made on about 125 subjects, Peck and Klarmann observed that the application of a hormone lotion containing 10,000 i.u. per fluid ounce, caused definite histological changes which, in their opinion, explain the anti-wrinkling effect: (1) The elastic tissue appeared to be increased in four out of five biopsies. (2) While not conclusive, there was a tendency to an increase in the thickness of the epidermis. (3) In two out of five cases the collagen fibres were definitely "plumper" and associated with a mild edema.

The action is said to be more noticeable in the older age-groups, and, although natural estrogens appeared to be more effective topically than synthetic products, the difference is not considered significant.

Polyethylene Glycol as a Tablet Binder

There are two general methods in current use, say B. Miller and L. Chavkin (*J. A. Ph. A.*, Scient. Ed. 43:486, 1954) for the production of compressed tablets. Most tablets are prepared by the wet granulation method or by double compression, except those made of materials which can be compressed directly. The object of both methods is to change the powdered tablet components to granules so that uniform, hard, table tablets can be produced by compression.

The process developed by Miller and Chavkin makes it possible to produce pharmaceutically elegant compressed tablets without the necessity for wet granulation. Through the inclusion of powdered polyethylene glycol 4000 in the formula for the tablet, it is possible to compress the properly mixed powdered components into "slugs" which are then screened and recompressed into satisfactory finished tablets. This process has been carried out with the use of

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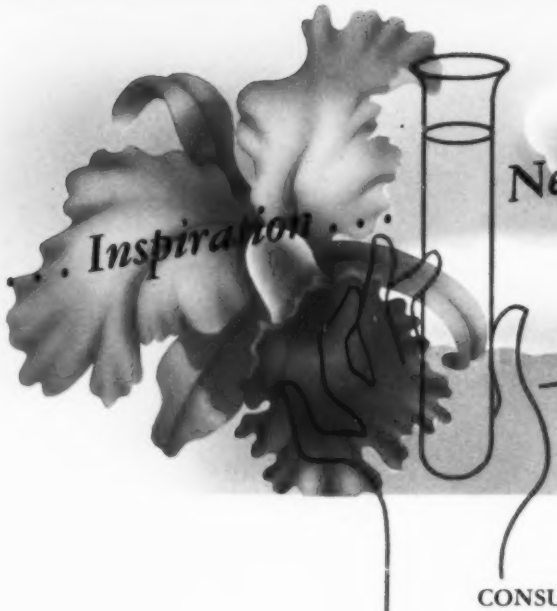

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a conventional rotary tablet press operating at high speed. This method thus eliminates the need for slow, heavy-duty tablet presses which are currently used in the double compression method for tablet production. It completely eliminates the use of granulating solutions and the lengthy drying process necessary in the wet granulating method and reduces the tendency for "classification" to take place during compression. Thus, the time required for the production of compressed medicinal tablets is considerably shortened and the preparation of a wide range of tablets by the double compression method is made feasible.

Olive Oil in Cosmetics

In a discussion of the pharmaceutical uses of Spanish olive oil, J. M. Calvo and A. S. Rinz (*Chem. Prod.* 17:173, 1954) also present considerable information on the employment of this oil in cosmetic products. Used externally, it lubricates the skin so as to prevent dehydration and imparts elasticity, flexibility and protection. Its use is therefore indicated in first-grade and second-grade burns. Its excellent emollient properties also enable it to be used for curing dry skin, removing scabs and scars and, in short, for removing crust-like formations and locally treating wounds and inflammations. Olive oil also provides protection against the irritating action of air and sunlight on the skin when it is exposed to inclement weather.

Typical formulas illustrating the use of olive oil in cosmetics are given by Calvo and Rinz as follows:

Skin Oils

(1)	Liposoluble chlorophyll	10.0 parts
	Bergamot oil	10.0 "
	Oil of laurel	30.0 "
	Olive oil	350.0 "
	Peanut oil	600.0 "
(2)	Spirit of lavender	2.0 parts
	Siberian pine oil	28.0 "
	Liposoluble chlorophyll	1.0 "
	Olive oil	970.0 "

Dermofunctional bronzing oil

Olive oil	50.00 parts
Oil of dark pine	1.40 "
Spirit of lavender	0.10 part
Liposoluble chlorophyll	0.09 "

Sunburn oil

Arachis oil	60.0 parts
Olive oil	35.0 "
Oil of laurel	3.0 "
Bergamot oil	1.0 part
Liposoluble chlorophyll	1.0 "

Non-greasy creams for the hands

(1)	Lanolin	100.0 parts
	White wax	90.0 "
	Cocoa butter	45.0 "
	Stearing	45.0 "
	Chloresterine	20.0 "
	Olive oil	450.0 "
	Lecithin	10.0 "
	Water	240.0 "
	Preservative	2.0 "
(2)	Stearin	100.0 parts
	Trianethanolamine	150.0 "
	Olive oil (or liquid paraffin)	150.0 "
	Glycerine	100.0 "
	Lecithin	10.0 "

Massage oils

(1)	Lanolin, anhydrous	6.0 parts
	Olive oil	94.0 "
(2)	Lanolin	6.0 "
	Olive oil	2.0 "
	Nut oil	1.0 part

Paste for pomade

Soft wax	200 parts
Benzoinated fat	200 "
Olive oil	600 "

Pomade in stick form

Olive oil	90.0 parts
White wax	70.0 "
Spermaceti	10.0 "
Bergamot oil	2.0 "
Citronella oil	0.5 part

Quinine pomade

White wax	200.0 parts
Benzoinated lard	200.0 "
Olive oil	600.0 "
Alcoholic quinine extract	10.0 "
Alkannin	0.5 part
Chlorophyll	2.5 parts
Essences and coumarin	sufficient

British Silicone Creams and Ointments

M. M. Malloch (*Pharm. J.* 173:141, 1954) reports that he has been investigating the possibilities of incorporating silicone fluids in certain creams for external use with a view to producing preparations which would be repellent to water and therefore more resistant to wet conditions. Possible uses for these preparations are as barrier creams, toilet preparations for infants, and in the treatment of certain sinus and macerated conditions.

Malloch found that the compounding of creams and ointment bases containing silicone fluid MS 200 (centistokes 350) presented little difficulty. Oils, waxes and the silicone fluid were heated on a water bath until the solids had melted. The water (and water-miscible ingredients, when present) was heated to approximately the same temperature and then mixed with the oils, the mixture being stirred until cold.

The following preparations seem to be the most suitable pharmaceutically of the various combinations tried:

Silicone fluid (centistokes 350)	30.0 per cent
Cetyl alcohol	10.0 " "
Yellow soft paraffin	60.0 " "

This ointment is greasy but has very good water-repellent properties. A simple mixture of silicone fluid and yellow soft paraffin is not stable; the fluid separating out.

Silicone fluid	30.0 per cent
Stearic acid	11.0 " "
Triethanolamine	4.0 " "
Yellow soft paraffin	10.0 " "
Liquid paraffin	24.0 " "
Water, to make	100.0 " "

A cream of this formula is smooth and pleasant to use, it spreads easily and is slightly greasy.

Silicone fluid	50.0 per cent
Magnesium stearate	50.0 " "

This preparation is very stiff but can be rubbed in satisfactorily.

Silicone fluid	70.0 per cent
Magnesium stearate	30.0 " "

The increased proportion of Silicone fluid gives a vanishing cream type of preparation. It is very slightly greasy and has good water-repellent properties.

Silicone fluid	30.0 per cent
Stearic acid	5.0 " "
Cetyl alcohol	2.0 " "
Diethylene glycol monoethyl ether	10.0 " "
Water, to make	100.0 " "

This preparation makes a very good vanishing cream with water-repellent properties. The proportion of Silicone fluid can be increased if desired and the cream can be diluted with water.

(Continued from page 826)

different to the solvent action of water. The manufacturer of these compounds will render valuable assistance to those interested.

Screens which are oil soluble and which must obviously be exhibited in oily or greasy bases, are invariably immune to dilution by perspiration. Also the oily products are appreciably resistant to removal by swimming. They do possess other advantages and liabilities which will be brought into view later.

Staining

Staining tendencies is a characteristic which, while not vital, can be the source of much annoyance to both consumer and manufacturer. The unsubstituted esters of para-aminobenzoic acid are somewhat prone to display such an effect. In solution, these agents, if allowed to contact white or light-colored fabrics and if exposed to the sun, will produce a light yellow stain that is difficult to remove. In view of the tremendous and incomparable efficiency of this class of compounds, this staining is a negligible failing. Any contemplated sunscreening chemical should be scrutinized for this capacity, and if excessive, discarded.

Sunscreens must not impart an objectional color to either the finished product or to the skin after application, nor should any visible color change take place during exposure to the sun. These factors are easily checked by simple observation.

Physical Character of Sunscreens

The physico-chemical aspects of ultra-violet absorbents are noteworthy. The majority of chemicals advocated are crystalline, a few are liquids and several are seemingly amorphous. Those crystalline, when dissolved in a volatile vehicle, must be accompanied by a plasticizer or a small amount of non-volatile solvent, which prevents recrystallization of the screen after evaporation of the vehicle. It is readily appreciated that recrystallization would precipitate a discontinuous, powdery film on the skin which would result in uncertain, variable, and scattered ultra-violet absorption. A barrier of this description could provide but slight and undependable protection. A model sunscreen is one which by its inherent composition, would form a continuous, flexible, adherent film after dissipation of the vehicle, without a plasticizer. A compound which can achieve these functions without a plasticizer would beget two valuable advantages; first, since a plasticizer is not required the active material will not be diluted by the presence of a plasticizer but rather will be deposited in a film of 100 per cent concentration which is 100 per cent functional. This strongly augments the absorption or transformation of erythemogenic ultraviolet energy by means of the physical fact that herein the inter-molecular spaces are smaller, or in other words, the molecules are more closely positioned in their mutual relationship, than would be the case if the screen were in solution and if a plasticizer were attendant. The additional efficiency accruing thereby is especially laudable since it is acquired without increasing total concentration of the screening chemical. The second advantage ensuing from the avoidance of a plasticizer is greater resistance to contact removal. Unquestionably, there would be less inclination to adhere to the inevitably encountered objects such as blankets, chairs, beach clothing, sand, etc., if the protective film were dry or nearly dry, than if this same film were moist.

Lesser but Meritorious Specifications for Sunfilters

The writer has frequently noticed that sunburn preventives have been purchased after mild or severe solar burns have been incurred. The manifest and correct deduction is that the preparation will now be applied on injured and hypersensitive skin. We have discussed irritantogenic potentials and we have pointed out that hypersensitive skin amplifies the possibilities of unfavorable reactions towards screening chemicals. Sunscreens should of course not only be devoid of such disposition, but they should exert a soothing effect when applied on damaged skin. Various esters of unsubstituted para-aminobenzoic acid fulfill this virtue quite adequately since they possess anesthetic properties ranging from nearly imperceptible to strong.

The pigments and other opaque and insoluble chemicals are highly recommended by those who are not familiar with the sunbathing public. Preparations containing the above type of screens deposit a coating of material such as titanium dioxide, zinc oxide, etc., which is extremely and objectionally conspicuous. Furthermore they produce an unpleasant "feel" on the skin. Unless accompanied by a lipoid of some sort, these agents are drying, withdrawing moisture and possibly other fat like substances where applied. Screens should not be refractory to incorporation into lotions, creams, oils or ointments. Pharmaceutical problems can be avoided by selecting compounds with the proper solubility for the bases contemplated.

No single sunscreen at the present writing, can encompass every requisite advanced. Spectral efficiency, quantitatively and qualitatively, and dermatologic inocuity must be guaranteed without compromise. Other attributes are amenable to some latitude. Possibly the safest course to follow in the formulation of a sunburn preventive is to choose a sun filter from among those which are instrumental in commercially successful products, and which for added security, have withstood the gruelling test of time. Unless infinite care is exercised in every single respect dwelled upon, launching a suntan lotion with a new, unknown, or unproven sunscreen is fraught with financial peril.

Classifications of Sunscreens

Those compounds which are effective, or reputed to be effective, in the prevention of solar burns, may be

(Continued on page 834)

for

MILDER COSMETICS

MAYPON 4 C

A HIGHLY PURIFIED

PROTEIN—FATTY ACID—CONDENSATE

satisfying the Draize-Woodward eye irritation test in all concentrations

ANIONIC • LIME STABLE • HIGHLY SUDSING

Specifications

Form and color	Light tan clear liquid
Specific gravity	1.070 to 1.090
Solids	35 to 37%
pH	6.3 –7.3
Active Ingredients	(approx.) 33 to 35%
Solubility in water	In all proportions
Iron	Less than 20 p.p.m.

Applications

Shampoos

Permanent cold wave solutions

Liquid bath preparations

Cosmetic creams

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Animal Health

Unidentified Growth Factors for Chicks

In a report of research progress at the University of Maryland Agricultural Experiment Stations (Bull. A-78) it is stated that studies on the multiplicity of factors in the "unknown growth factor complex," the development of more sensitive assay procedures, the fractionation and purification of two distinct unidentified chick growth factors and practical studies designed to determine sources of these factors have been conducted.

Using chick growth as a criterion of measurement, the effect of different carbohydrate sources, certain growth promotants, iodinated casein, increased levels of B-complex vitamins, and multiple deficiencies of unidentified factors has been studied with semi-purified diets. The results indicate that the use of 0.3 per cent iodinated casein (protamone) and/or sucrose, instead of cerelose, increases the growth response of the chick to an unidentified factor in certain liver preparations. Increased levels of B-complex vitamins or the addition of 20 ppm. of aureomycin and 50 ppm. of 3-nitro-4-hydroxyphenylarsonic acid, alone and in combination, spared the dietary requirement for this factor. Limited data indicate that multiple deficiencies of members of the "unknown factor complex" influence the chicks' ability to respond to a single factor alone.

Evidence has been obtained which indicates that strain differences influence the chicks' requirement for the "liver factor." Two strains of New Hampshires, developed primarily on the basis of high and low thyroidal responses to the feeding of thiouracil, were used. In a series of experiments in which sex was determined at four weeks, it was also observed that female chicks responded to a greater extent than did males to the factor in liver preparations or fish solubles.

Other growth promotants, including procaine penicillin G, aureomycin, bacitracin, terramycin, streptomycin sulfate, polymyxin B, and sulfasuxidine have been used in various combinations without improving the sensitivity of the chick growth assay for either the "liver factor" or the "whey factor."

The results of a series of experiments involving purified diets strongly indicate that at least three unidentified chick growth factors are required under certain conditions. Alfalfa meal, forage grass juice and a corn fermentation product appear to be good sources of the third factor while liver products and dried whey products, respectively, contain the other two. Fish solubles appears to contain the "liver factor" and the "Alfalfa factor." Dried whey and dried brewers' yeast both appear to contain mixtures of these factors, which vary to some extent from sample to sample.

Stomach Parasites of Cattle

In discussing stomach parasites of cattle, A. M. Mills (*Vet. Med.* 49:226, 1954) points out that Ostertagia inhabit the abomasum almost exclusively. The Trichostronglyus may inhabit the abomasum and the small intestine but are found mostly in the walls of the small intestines. The single species in the abomasum are the most important and cause the most trouble.

Recommended treatment is eight to 16 ounces of a one per cent copper sulfate solution. For weak animals use one-half the dose one day and the other half the next day. Repeat treatment in ten days. Another satisfactory schedule is to treat with two to six ounces of a 0.5 per cent solution of copper sulfate twice a week for four to six weeks. Copper sulfate has some hematopoietic value. Another suggested treatment consists of:

Ferric ammonium citrate	**0.5 lb.**
Copper sulfate	**20.0 Gm.**
Cobalt	**10.0 Gm.**
Water, to make	**1.0 gal.**

The dosage is two to six ounces twice weekly for four to six weeks.

It is noted that phenothiazine gives best results in cases of common internal parasites of cattle. The system of using a mineral mixture in self-feeders consisting of three parts each of ground limestone, bone meal, and salt and one part phenothiazine, by weight, is excellent, but boxes should be placed in the shade and scattered to assure availability to all animals of the herd. These containers also should be protected from rain.

Chlorophyll vs. Dog Odors

Two reports point to the continued interest in the effect of chlorophyll preparations for reducing dog odors. In one of these studies R. D. Wright, G. O. Kohler and R. D. Hoover (*N. Am. Vet.* 35:677, 1954) found orally-administered preparations containing chlorophyll derivatives were active in reducing skin, ear and mouth odors of dogs fed a commercial, meal-type dog food. Two different preparations showed deodorizing activities proportional to their content of chlorophyll derivatives. Although individual dogs varied considerably in their response, average deodorization was found to be a linear function of a log dose expressed on a body weight basis.

During these investigations it was observed that the general health of the dogs, and the condition of their hair coats in particular, seemed to improve while on chlorophyll feeding. In a series

of tolerance tests, levels as high as 2.64 per cent of lot 1 chlorophyll preparation (equivalent to .015 per cent chlorophyll derivatives) have been fed. No evidence of toxicity was noted in the gross appearance of the skin, buccal epithelium, eyes or ears. Feces were normal in consistency although dark in color. The blood pictures were normal in all respects. Organ-weights per unit of body weight were normal as were the gross and microscopic appearances of the livers, spleens and kidneys. From these studies it was concluded that the preparations fed were nontoxic at the highest levels used.

In the second investigation, H. T. Gier (*Vet. Med.* 49:377, 1954) studied the effect of chlorophyll derivatives on the mating odors of dogs. In this work, 25 bitches were treated with varying levels of chlorophyll derivatives during estrum, and then were tested with laboratory males and outside males to determine the effect on attraction odors. Bitches given 4 mg. chlorophyll derivatives per kg. of body weight per day showed little, if any, attraction for males other than by direct flirting. Bitches receiving less than 3 mg. chlorophyll derivatives per kg. body weight per day had normal odor attraction for males. Chlorophyll in effective doses removed the attractiveness for males within 24 hours, and remained effective for more than 24 hours but less than 48 hours. Chlorophyll was well received by most dogs.

Furazolidone for Fowl Typhoid

Fowl typhoid has been a disease of major economic importance in the poultry industry for many years. Poultry pathologists of the Eastern United States report that the incidence of this disease has increased in most states during the past several years. It has been especially severe in some of the concentrated turkey - and broiler - producing areas.

Of importance, therefore, is the report by A. S. Cosgrove (*Vet. Med.* 49:393, 1954) that the addition of the antibacterial agent, furazolidone (Furoxone), to the feed reduced mortality and controlled outbreaks of fowl typhoid in three flocks of turkeys and four flocks of chickens under field conditions.

His findings indicate that the turkey and broiler growers now have available another chemotherapeutic agent that will permit them to rear their flocks to a marketable age without suffering uncontrolled mortality from fowl typhoid. The recommended procedure at this time would be to use furazolidone at a 100 Gm. level per ton of feed for two weeks to control the outbreak and then change to a 50 Gm. level until the birds are sold.

Penicillin and Poult Growth and Feeding

Experiments were made by S. J. Slinger and W. F. Pepper (*Poultry Sci.* 33:746, 1954) to determine the effect of penicillin on the growth of turkey poults to 25 and 28 days of age with both free choice and equalized feed intake. The results indicate that, under the conditions employed, the mode of action of penicillin in stimulating the growth of turkey poults may be explained largely, though not entirely, on the basis of the increased feed consumption per unit of body weight which occurs during the first week of life.

In commenting on their findings, the investigators point out that many experiments have been made in an attempt to explain the mechanism of the growth promoting action of antibiotics on the basis of intestinal floral alterations. In work of this kind little attention appears to have been paid to the age of the birds involved. The results of the present experiments serve to emphasize the importance of the age factor and indicate that antibiotic-induced intestinal floral changes occurring during the first week of life are of greatest importance.

Vitamin E Deficiency in Calves

In experimental studies on tocopherol deficiency in young calves, J. W. Safford, K. F. Swingle and H. Marsh (*Am. J. Vet. Res.* 15:373, 1954) found that signs typical of those seen in field cases of the skeletal type of "white muscle disease" were produced in calves fed a "synthetic milk" ration deficient only in vitamin E (*alpha*-tocopherol). Posture maintenance, locomotion, and nursing showed a progressive weakness. Bilaterally symmetrical pairs of muscles were involved. Dystrophic lesions were manifested macroscopically by whiteness and microscopically by fragmentation and hyalinization of the muscle fibers, accompanied by extensive nuclear invasion. Deviation of the heart action from normal was slight and heart lesions were not discernible macroscopically or microscopically. Neither creatinuria nor other urinary changes were symptomatic in these cases, and no cytological or chemical changes in the blood other than absence of tocopherol, were detected. Tocopherol supplementation at the time of extreme muscular weakness resulted in immediate and nearly complete recovery.

Aureomycin and Egg Production

The data presented by S. L. Balloun (*Poultry Sci.* 33:867, 1954) indicates that under conditions unfavorable to high egg production, the addition of antibiotics at a high level may improve egg production. In his experiment, production increased an average of nearly 40 per cent in eight lots of hens after the addition of 50 mg. aureomycin per pound of diet, while in four lots of birds fed similar diets without aureomycin, no change occurred. The greatest increase in egg production following the addition of aureomycin to the diet was obtained with an all-plant protein diet.

Combined Therapy of Chicken Respiratory Disease

During the past several years, says S. C. Schmittle (*J. Am. Vet. Med. Assoc.* 125:221, 1954), chronic respiratory disease has been occurring with increased frequency. It has become a major economic problem, especially among broiler raisers. Because of the antibacterial spectrum of penicillin and because of the synergism between penicillin and streptomycin, it was thought that a combination might result in a more satisfactory response in this persistent and progressive type of mixed infection. Schmittle found that the intramuscular administration of 0.5 to 1.0 ml. of a suspension containing, in each milliliter, 10,000 units of dibenzylethylenediamine dipenicillin G and 50 mg. dihydrostreptomycin base, as sulfate, produced favorable results in the treatment of chronic respiratory disease of chickens. There was a reduction in mortality, and feed consumption was resumed. There was a tendency toward general improvement of the flocks and a reduction in the number of culls. In broilers, the number of condemnations at slaughter was reduced.

(*Continued from page 830*)

divided into two distinct classifications; physical and chemical. To the former, the physical group, belong such chemicals as titanium dioxide, zinc oxide, para-aminobenzoic acid, calamine, magnesium oxide, calcium carbonate, talc, kaolin, bentonite, lithopone, etc. They are all virtually insoluble and their function is dependent upon opacity and reflectivity. In the concentrations recommended, (10 to 20 per cent), and in whatever manner exhibited, they erect a solid, dense, completely impenetrable barrier against all ultra-violet and visible frequencies. If a thin coating is utilized, more or less total passage of ultra-violet radiation takes place since the particles comprising the protective wall are too distant from each other to impede or block penetration. Reflectivity also contributes, but in a lesser degree, towards the gross exclusion of actinic rays which might strike upon the surface of these insoluble compounds. In the spectral region between 3000 and 4000 Angstroms, Hulbur[27] found the diffuse reflectivities in relative units for various substances to be as follows: Maine sand, 81; Florida sand, 15; Crushed quartz, 40; Snow, 35; Plaster of paris (calcium sulphate), 40; White paper, 8; Sodium carbonate, 14; Sodium chloride, 38; White cotton cloth, 36. A creditable assumption would be to ascribe to titanium dioxide and zinc oxide, a reflective index comparable to zinc sulfate. The other compounds would probably strike an average between the highest and lowest reflectivities, all of which are appreciable.

The total blocking of impinging ultra-violet energy by the concerted effects of opacity and reflectivity disqualifies chemicals in the physical category from rendering the service required in a sunburn preventive. In an earlier discussion, attention was directed to the desirability of allowing to penetrate through a sunburn preventive that quantity and quality of solar radiation which will stimulate some degree of erythemic response. As was just pointed out, the opaque screens cannot provide such metering. To advocate the use of same in commercial products betrays a limited perspective of the physiologic effects of ultra-violet energy and the objectives of a suntan lotion. Preparations dependent upon physical filters would deprive the sunbather of healthful and cosmetic benefits available by solar irradiation. To deprive the public of improved dermatologic tone and pigmentation would most certainly insure a short life for any product of such caliber. A specific but relatively small market for the opaque suntan preparations is in the prophylactic and therapeutic management of certain dermatologic disorders, and possibly for military purposes, wherein actinic rays are entirely prohibited.

Notwithstanding the logic and authenticity of the above disqualification, one of the compounds belonging to the opaque division, para-aminobenzoic acid, has been strenuously and altruistically, sponsored as being the most of all subscreens. The solubility of this chemical in water is 0.3 grams per 100 grams, and 11.3 in 90 per cent alcohol. Practically speaking, PABA would be regarded as insoluble, therefore a preparation containing 15 per cent para-aminobenzoic acid would of necessity be a suspension or dispersion, unless the base were 90 per cent alcohol. In either case, after dissipation or thickening of vehicle or base, a solid coating of PABA will be formed where applied. As for impenetrability, Rothman and Henningsen[24] carried out a limited number of erythemal tests with 15 per cent PABA in Ruggles cream (a vanishing cream). Exposures protected by Ruggles cream without PABA required an approximate average of three minutes to produce a minimum perceptible erythema. Irradiations up to 120 minutes guarded by Ruggles cream 15 per cent PABA failed to provoke a minimum perceptible erythema, or any erythemal response. The thickness of the studied films in both instances was 0.08 millimeter. This brings into sharp focus the fact that the defense depicted is utterly resistant to the passage of erythemogenic energy and that any sunbather using same would be denied ultra-violet stimulation. The above investigators conducted four more erythemal tests with the same products but with the protective film reduced from 0.08 millimeter to 0.03. Average results yielded 1.25 per cent transmission of erythemogenic rays through 15 per cent PABA in Ruggles cream. This percentage of a 240 minute average daily exposure would be tantamount to a brick wall interposed between the sun and the heliophile. In further support of total impenetrability, it may be said that the chances of forming a film 0.08 millimeter are definitely greater than one only 0.03 millimeter, especially with a dispersion as heavy as 15 per cent PABA would be. With this type of sunscreening, there can be but slight compromise. If the monoclinic prisms of PABA are reduced in their mutual proximity by a reduction in concentration or extension of applied films to extreme thinness, unrestricted transmission will be facilitated, and inversely, if the crystals are in close proximity, total opacity will be the rule.

(*To be continued next month*)

ANIMAL AND HUMAN SKIN TESTING

(*Continued from page 769*)

thema with edema (2 plus). This type of reaction is quite characteristic of some phenolic resins and plastics and in our experience is being seen more frequently. This delayed reaction may be a variation of the fatigue reaction and is often better elicited through repeat insult techniques rather than by the more simple closed patch method. The repeated insult patch technique advo-cated by Shelanski[3] has its greatest advantage in meas urement of this type of fatigue reaction, for it can give a graded reading obtained over a period of days required by an irritant to produce skin injury. The disadvantages of this particular test in our opinion, offset its advantages, because it does not mimic real use of a product and it is difficult to get subjects. Repeated

(*Continued on page 840*)

REASONS FOR SPECIFYING

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Highest purity;
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ASCORBIC ACID MERCK U.S.P. SUPER-FINE POWDER
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Niacinamide U.S.P.
Pyridoxine Hydrochloride
Crystalline Vitamin B_{12} U.S.P.
Triturations of Crystalline Vitamin B_{12}
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Vitamin K_1
Choline Chloride

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Perfumer's Shelf

Terpeneless and Sesquiterpeneless Oils

In a comprehensive discussion of terpeneless and sesquiterpeneless essential oils appearing in the *Perfumery and Essential Oil Record* (45:117, 1954) the meaning of these terms is explained in some detail. Thus, if in an essential oil the terpenes (and usually the residue) are removed, then the oil is designated as a terpene-free or a terpeneless oil. It still contains the sesquiterpenes and the flavoring constituents. If now the sesquiterpenes are removed as well as the terpenes, leaving only the flavoring material, the oil is said to be a sesquiterpeneless oil. In some cases where the sesquiterpene content of the oil is negligible the two terms are used synonymously. For instance with peppermint oil, the highest possible degree of concentrated oil is usually called terpeneless.

In a consideration of the advantages of these oils, it is noted that the first point in their favor is the fact that they can be stored longer. An ordinary essential oil containing large quantities of terpenes tends to resinify and develop a "turpentine-like" aroma and flavor. The concentrated oils do not suffer from this disadvantage, although they should be kept in a well-filled dark bottle in a cool place. Thus these concentrated oils can be stored for a longer time. Further, owing to their concentration, they take up less space than the whole oils, and a saving in space and freight is effected.

The great benefit which their use entails is the saving in spirit. Because of the high duty on ethyl alcohol it has become necessary for the user of this material to produce an article with less spirit content, but with the same strength and quality of odor and flavor. It is in this direction that the terpeneless oils have been extensively used. If the amount of spirit necessary to effect solution of the oils in perfume compounds, essences, and such, to be reduced and an equivalent of water substituted, it is found that the product becomes cloudy, and that to effect solution of a natural oil, a spirit strength of about 90 per cent alcohol is necessary. This cloudiness is solely due to the terpenes and sesquiterpenes of essential oils. By the removal of these bodies, as in the terpeneless and sesquiterpeneless oil, the aroma and flavor value is retained while at the same time solution in weak spirit is possible. For the preparation of the so-called "water soluble" perfumes these products offer a great advantage.

A third advantage of the terpeneless and sesquiterpeneless oils is their adaptability to powders such as lemon and barley crystals, lemonade crystals, bath crystals. As noted in the first advantage, non-oxidizability is one great benefit, but probably an even better benefit is the "non-wetting" of powders. The quantity of terpeneless lemon oil is only about one-tenth that of the whole oil. The latter, when sprayed on to lemonade powders and similar articles, tends to give the product a damp and wet appearance which prevents it from free running and also tends to make the powder lumpy in appearance. The smaller quantity of terpeneless oils required for this and similar types of articles reduces these tendencies to a minimum.

It is pointed out that terpeneless oils can be used for cheap perfumes, as weaker spirit can be used owing to the removal of the terpenes. Terpeneless lemon, bergamot and terpeneless rosemary find application in this manner. Another use for the terpeneless oils is the preparation of concentrated pharmaceutical preparations which are diluted down usually one in eight to give standard infusions, and the like.

Oil of Artemesia Arporescens

In continued studies of the essential oil of Sardinian aromatic plants, A. Ratta and A. Maccioni (*Rend. seminar. fac. sci. Univ. Cagliari* 23:91, 1953, through *Chem. Abstr.* 48:8490, 1954) have examined a sample of *Artemesia arborescens* picked during January to March near Cagliavi. The plant contained an essential oil having the following characteristics: blue color, slightly bitter taste and characteristic aromatic odor; specific gravity: 0.9393; relative viscosity (Ostwald) at 17° C.: 4.13; soluble in almost all organic solvents; solubility in 80 per cent alcohol: 1:12. They found 16 per cent of thujone, some borneol, and 21.9 per cent of alcohols, consisting mainly of thujol. Formic, palmitic and stearic acids were obtained by ester hydrolysis.

Ambrettolide

Cyclohexadecenolide, better known as ambrettolide, says S. T. Tong (*Soap, Perf. & Cosmetics* 27:716, 1954) is a large-ring lactone occurring naturally in the oil obtained from the seeds of *Hibiscus abelmoschus* (ambrette seeds, musk seeds), a plant grown in the Seychelles, Madagascar and the West Indies. The "exalting" effect of the oil when used in fine perfumes, together with its strong, musky odor, led Kerschbaum in 1927 to suspect the existence in the oil of a similar lactone to that which he had extracted and identified in the oil obtained from the roots of *Archangelica officinalis* (angelica root oil). Kerschbaum isolated the lactone, which he named ambrettolide, and elucidated its structural formula. Since his classical work was published, a number of syntheses of ambrettolide and its isomerides have appeared in the literature and as patented processes, and some, no doubt, are operated industrially as secret processes.

According to Tong ambrettolide and its isomerides are of great value in perfumery both for their floral-musk note and their truly remarkable ability to enhance and intensify other odors. This latter exalting power, which causes a perfume composition to appear stronger in odor, is coupled with excellent blending properties which help to round off the individual components in a perfumery blend to produce a smooth harmonious whole. The odor-enhancing properties are improved by maturing the composition for at least one month. This applies to all types of perfumes but more particularly to light fantasy bouquets and floral types. The heavier

TOP NOTES by Fritzsche

FRITZSCHE BROTHERS, INC

FRITZSCHE BROTHERS, INC

A THOUGHT for the Month

"Tolerance is the positive and cordial effort to understand another's beliefs, practices and habits, without necessarily sharing or accepting them."

—JOSHUA L. LEIBMAN

FLOWER of the Month

November — Chrysanthemum

December — Narcissus or Holly

MAYBE YOU KNOW HIM . . .

WITHIN his short span of 31 years, RALPH ARSENAULT, now representing Fritzsche Brothers' Canadian affiliate in the Provinces of Quebec and eastern Ontario, has packed a world of experience. Born in 1923 in the busy industrial town of New Carlisle on the Gaspé Peninsula, Ralph left there in the early 40's to begin a liberal arts training at Collège Jean de Brébeuf in Montreal, followed by study in chemistry at McGill University and general science at Sir George William's College. Completion of his college career was not without toil and hardship. Spare time work as a waiter, a furnace stoker and a pulp mill worker helped to finance it; war service in the Canadian Army, then the Navy and finally the Merchant Marine, helped to delay it. But perseverence won out and in 1948 he made three momentous gains: he acquired a B.S. degree, a job selling chemicals and a beautiful bride, product of his beloved Gaspé. Four years later he joined Fritzsche Brothers of Canada, Ltd. In spite of heavy competition and his newness to the territory, Ralph has found that consistent effort and willingness to work with customers, oftentimes in their own plants or laboratories, and the offering of dependable products,—these really do pay off! Thus, with a promising business future, a happy marriage and three fine children—Joanne, Susan and Michael—to bless it, plus a few healthful hobbies like woodworking, hunting, fishing and golf, it sounds as though Ralph Arsenault has found the right formula for long term happiness.

RECOMMENDATION of the Month

IRISYNTH

This beautiful synthetic is a faithful interpretation of the true fragrance of orris concrete, with all its fine delicacy and soft, powdery tonality. It may be used as a complete replacement or as an economical extender for the natural concrete. IRISYNTH is indispensable in woody type odors. It blends beautifully with all floral notes, and in compositions for scenting face powders, imparts great tenacity; it does not cause discoloration. Priced at $14.90 per lb.; $.95 per trial ounce.

WE CAN HELP YOU, TOO!

One of our most gratifying experiences is to observe, from our own records of their purchases, how some of our best accounts have grown from very modest beginnings. And what is most satisfying to us is the realization that our laboratories, materials and technical aid at the time they most needed helpful assistance and proper materials, might well have played a significant part in their solid growth. It is also encouraging to note that, today, firms large and small are relying more and more upon the accepted competence of our large and experienced staff to assist them, right from scratch, in the solution of their finest perfuming or most difficult odorizing problems. If your firm has not sought our assistance, why not consult with us the next time you have a challenging fragrance problem to contend with.

CREATORS of MADE-TO-ORDER FRAGRANCES for PERFUMES, TOILETRIES and COSMETICS

ODORANTS and DEODORANTS for INDUSTRIAL and TECHNICAL USE

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DON'T MAKE ME TAKE THAT AGAIN!

HAVE a heart, Mommy! Remember that your little one is extra sensitive to taste and when the medicine you give him is unpleasant the only way he can register his displeasure is by his crying and his tears . . . There is really no need to subject anyone, baby or grown-up, to a disagreeable tasting medicine because flavor science has solved the problem of masking virtually all of the important medicinal ingredients that tend to cause unpalatability of flavor. It is just a matter of combining ingredients that have proven compatible and appropriate. Having pioneered in this field for many years, our flavor specialists are well prepared to help the pharmaceutical manufacturer solve most any problem involving flavor. It is, therefore, with confidence that we invite your consultation with our experts.

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blends benefit to a greater extent from the fixative character of the lactone. Where a distinct musk note is required, ambrettolide may be used at the rate of one per cent or more in a perfume composition, but where it is required as a blender and intensifier a quarter per cent or less will usually suffice.

Macrocyclic compounds such as ambrettolide are also of value in flavor compositions. Improved perfume and flavor compositions are obtained by relatively small additions of the lactone and compounders will find it advantageous to work with a 10 per cent solution in a suitable solvent, both for ease of handling and effective control. It is readily soluble in ethyl and benzyl alcohols, di-ethyl and di-methyl phthalates and benzyl benzoate. Ambrettolide is also very useful as a pre-fixing agent for perfumery spirit, where a proportion as low as one part in ten thousand parts of alcohol will aid and speed maturing to a more marked extent than most of the more usual prefixing agents.

Pine Gum Turpentines

Further studies, covering the composition of three additional gum turpentines of pine, have been made by N. T. Mirov and P. M. Iloff, Jr. (*J. Am. Pharm. Assoc.*, Scient. Ed. 43:378, 1954). A small sample of *Pinus Chihuahuana* oleoresin from Durango, Mexico was found to contain 20 per cent of turpentine. The physical characteristics of this turpentine were as follows:

Specific gravity	**0.8646**
Index of refraction	**1.4730**
Specific rotation	**−25.5**

Distillation data indicate that the turpentine of *Pinus chihuahuana* consists of *l*-α-pinene, 50 per cent, β-pinene, 20 per cent, *l*-limonene, 15 per cent, and *d*-longifolene, five per cent.

Investigations were made on a sample of oleoresin from *Pinus apacheca*, commonly called Apache pine, from Coronodo National Forest in southeastern Arizona. The turpentine obtained from this sample had the following properties:

Specific gravity	**0.8648**
Index of refraction	**1.4695**
Specific rotation	**+42.0**

It was determined from fractional distillation data that gum turpentine of *Pinus apacheca* contained 79 to 80 per cent *d*- and *dl*-α-pinene, two per cent *l*-β-pinene, two per cent dipentene, 12 per cent *d*-longifolene plus a trace of an unidentified solid compound.

Investigations were also made on the oleoresin of *Pinus monticola*, which is known as Western White pine. It grows over a wide range extending from Vancouver Island and southern British Columbia through northern Idaho (where it is at its best) to northern Montana and southward through Washington, Oregon, to the Sierra Nevada mountains of California. The gum turpentine studied by Mirov and Iloff was obtained from the Priest River Experimental Forest of northern Idaho. The physical characteristics of the turpentine of *Pinus monticola* were as follows:

Specific gravity	**0.8500**
Index of refraction	**1.4687**
Specific rotation	**−28.8**

It was found that *Pinus monticola* contained two to three per cent *n*-heptane, 32 per cent *l*-and-*dl*-α-pinene, 45 per cent *l*-β-pinene, seven per cent *l*-limonene, two per cent undecane, two per cent bornyl acetate, four to five per cent sesquiterpenes of which one is monocyclic and another bicyclic and seven per cent pot residue and loss.

Daphne Perfume

Describing the odor of daphnes as being of a champaca or clove-jasmin type, and describing the general odor pattern as lime blossom-muguet-rose, F. V. Wells, writing in October, 1954, *Soap, Perfumery and Cosmetics*, says that some perfumers appear to detect violet shading, but he feels that use of ionone should be contemplated with discretion. He suggests approaching compounding of the odor with rhodinol-rose, hydroxycitronellal, terpineol, cyclamen aldehyde, and bergamot, with a backing of indoloid jasmin artificial and ylang. Other interesting possibilities are lime oil (0.5-1 per cent), bois de rose, basil (traces), linalool, linalyl acetate, anisic alcohol, aubepine, phenylethyl dimethylcarbinol, cinnamic alcohol, phenylpropyl aldehyde and alcohol, alpha ionone, the various rose alcohols and their acetates, and the eugenols.

Mr. Wells suggests that the following be tried out as a basis for individual experimentation. He does not offer this as a finished formula, but rather as a starting point or as a stimulus for improved variations:

Hydroxycitronellal	**320**
Terpineol extra	**40**
Phenylethyl dimethyl-carbinol	**50**
Citronnelol	**120**
Rhodinyl acetate	**20**
Phenylpropyl alcohol	**23**
Phenylpropyl aldehyde	**0.5**
Cinnamic alcohol	**30**
Geranium oil Bourbon	**25**
Phenylethyl alcohol	**100**
Cyclamen aldehyde	**12**
Ylang ylang oil	**25**
Ionone alpha	**25**
Heliotropin	**21.5**
Aubepine	**20**
Anisic alcohol	**25**
Indole	**8**
Amyl cinnamic aldehyde	**35**
Benzyl acetate	**20**
Bergamot oil	**80**
Eugenol	**20**

Bulgarian Rose Oil

Bulgarian rose oil produced from the 1953 crop was high quality says Dr. Nicholas Nicolov, head of the Technological Section and Chemical Laboratories of the State Enterprise, Bulgarska Rosa, Sofia, in October, 1954, *Soap, Perfumery and Cosmetics*. In certain distilleries, oils with a very fine aroma contained up to 70 per cent free alcohols, calculated as geraniol, up to 3.9 per cent combined alcohols likewise calculated as geraniol, and up to 46 per cent citronellol, their rotatory power attaining up to −4.2°.

Chemical constituents of two Bulgarian rose oils were:

		I	II
1.	Specific gravity at 30° C.	0.8515	0.8575
2.	Refractive index at 25° C.	1.4580	1.4612
3.	Rotatory power (100 mm. tube)	−4.10°	−3.84°
4.	Freezing point	19.2	18.2
5.	Acid number	1.50	1.60
6.	Ester number	13.10	13.35
7.	Saponification number	14.60	14.95
8.	Acetylation number	226.00	224.65
9.	Free alcohols (as geraniol)	69.60 per cent	69.05 per cent
10.	Combined alcohols (as geraniol)	3.60 per cent	3.67 per cent
11.	Alcohols in general (as geraniol)	73.20 per cent	72.72 per cent
12.	Citronellol	44.10 per cent	42.80 per cent

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Abreast of the Markets

Anise Oil Higher

The price of anise oil advanced still higher last month to the level between $4.25 and $5 a pound, owing to the fact that there is virtually no material to be had on the spot market. The prospect for replacements is gloomy at the present time, as it has been ever since the ban on U.S. imports from Communist China.

Bergamot Oil Unchanged

Bergamot oil remained at $11.25 in November, with the demand reported as steady and replacements arriving in sufficient quantity to handle all needs.

Geranium Oil Firmer

While the price range of geranium oil did not change during November, spokesmen in the industry state that the oil is in limited supply in the Reunion area. Prices there are being kept high by the producers. Added to this is the fact that present crop of oil has been held up because of unfavorable weather. This will also add to the already tight situation.

Clove Bud Oil Firm

Clove oil was decidedly firmer last month, although there were no price changes on the spot market.

The clove leaf oil, on the other hand, has temporarily eased off. The new-crop material was distilled several months ahead of schedule so that at the present time there are ample stocks at the origin. However, it is believed that, as soon as the shippers dispose of all the old-crop oil in order to make way for the new material, demand will be greater and the price will start to advance.

Peppermint Oil Steady

For the time being peppermint oil appears to be quite stable as far as the spot market is concerned. There was no change in price in November from the previous figures of $7.75 to $8.50 for the natural oil and $8.50 to $9 for the redistilled.

Dealers report that the 1954 yield in peppermint oil was lower than had originally been expected. While this factor has not affected the market so far, some houses believe there may be an increased demand for the oil early next year. This may drive the price up at that time.

Cascara Demand Off

Although domestic needs for cascara sagrada lessened during the past month, reports have it that exports of the material are continuing at a high level of activity. There is ample material on hand to take care of all orders owing to favorable collections this year.

Iodine Higher

For the first time since last April, the price of iodine went up, the change amounting to 30 cents. The reason for this advance is that earlier this year there were two reductions in the iodine quotations owing to strong competition from Japan. Last month's advance was a re-adjustment in the spot market on Chilean iodine.

Coumarin Higher

Two producers advanced the price of coumarin last month, the latest change putting the figure at $3.20 for a 200-pound fiber drum; $3.30 for a 25-pound fiber drum; and $3.45 a pound. These prices will be effective as of January 1.

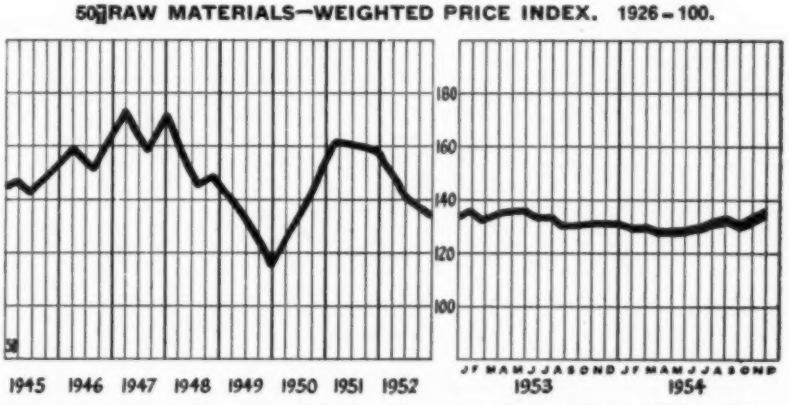
Although this item is no longer used in foods, it has considerable demand in both the perfume and soap fields.

Menthol Soft

With demand for menthol very sluggish at the present time, the spot market has been equally inactive. Dealers have been stocking up on supplies for the anticipated demand over the winter months which has not yet materialized. As a result, prices last month dropped to $8 a pound. As far as the Japanese material was concerned, there was almost none to be had on spot, except for individual orders.

Theobromine Higher

Theobromine advanced in price last month to $3.75 a pound in 100-pound drums, marking an over-all jump of 75 cents since July. Some sources expressed the belief that the higher theobromine figures would similarly affect caffeine prices.



The price index of fifty commodities for November advanced from 130.9 to 132.0.

(*Continued from page 834*)

insult can be done more satisfactorily with the guinea pig intradermal technique mentioned earlier. Here the animal receives an intradermal injection of the test substance in an appropriate dilution, every other day for 10 injections (21 days). Three weeks later a challenge injection is given. Responses are measured in terms of erythema, induration and vesiculation. A comparison of corn oil solutions of three different ointment preparations containing zinc oxide (X), sulfur-resorcin (Y) and an organic sulfur compound (Z) is shown in Figure IV, page 769.

Returning to the routine Schwartz-Peck human patch test—its standardization is so well established that if the proper technique is adhered to and a sufficient number of individuals tested, the predictions of irritation and sensitization potentials is good. Neither test is satisfactory to determine the so-called "Hardening" reaction, but these have been observed by all of us on both skin and mucous membranes. Perhaps the most striking instance in our experience has been the induced toughening of gum tissue through massage with a dentifrice material that was definitely a primary irritant (Ipana). On initial use of this preparation in a number of instances an erosion or superficial ulceration of the gums occurred. The inflammatory reaction was severe and it seemed that further use of dentifrice was inadvisable if not impossible. However, amazingly enough in each instance with continued use the gums healed completely and the reaction did not again manifest itself in these subjects.

The true sensitivity reactions have been much more difficult to predict than the primary irritations we have discussed previously. One reason for this is that the animal will apparently only respond to the strong sensitizer while man is much more susceptible. The techniques for measuring sensitivity reactions are essentially expansions and modifications of those methods used for measuring irritation. The standard method is the before mentioned skin patch test. This is the standard human skin test and when done correctly will give very comparable results between similar materials. Table I shows data on a series of soaps rotated through strictly

PRIMARY IRRITATION SERIES

Test Material	Skin Reactions Zero	Plus/Minus	One plus	Two plus	Total subjects
Soap A	69	102	41	0	212
Soap B	66	118	24	4	212
Soap C	60	114	36	1	211
Soap D	53	109	45	5	212
Cold Cream	210	1	1	0	212
Water	206	4	2	0	212

SENSITIZATION SERIES

Test Material	Skin Reactions Zero	Plus/Minus	One plus	Two plus	Total subjects
Soap A	32	108	61	2	203
Soap B	42	124	35	2	203
Soap C	31	128	42	2	203
Soap D	40	109	51	2	203
Cold Cream	202	1	0	0	203
Water	198	5	0	0	203

Table I. Patch Test Series (Soaps).

controlled patch test conditions. These are all well-known brands and the agreement is good. Of particular note is the "plus-minus" or "soap reaction." This is a mild chemical burn or dehydration due to prolonged contact the skin with the soap solution. It illustrates why the of routine test overgrades at times. Here we have exaggerated readings because the closed patch test is an artificial condition. The "soap reaction" may become so prominent that true differences between test materials may be masked. Incidentally a test on distilled water was run at the same time as the soaps because recently in court trial involving a hair dye preparation, the question was asked of one of us to "name one substance in the world to which someone might not be allergic." Distilled water was named and the defense attorney cited a published case in Detroit where that had been the offender. You see we had a few mild reactions. In the case of soaps, the test itself was more drastic than use would have been. The reverse, i.e., where the test failed to predict reactions is shown in Table II. Here the grades of positive response are

PROPHETIC PATCH TEST — HUMANS (200 INDIVIDUALS)
(Schwartz - Peck)

	Percentage Response						
	Initial				Challenge		
Lotions	A	B	C		A	B	C
Erythema	0	2	4	(2 week interim)	1	0	2
Induration							
Erythema	25	46	31	(2 week interim)	8	17	23
Induration							
Ointments	X	Y	Z		X	Y	Z
Erythema	2	11	3	(2 week interim)	1	12	0
Induration							
Erythema	16	20	6	(2 week interim)	13	19	10
Induration							

Table II. Prophetic Patch Test (Lotions and Ointments).

shown in two groups: 1) erythema with induration (2 plus and over), 2) erythema without induration (1 plus). Three lotions and three ointments were tested. The patch test response indicated very slight primary irritation from the lotions but no suspect sensitization reactions. The ointments also gave very little indication of potential sensitization. Analysis of the data of Table II would not suggest that any of these materials would be detrimental in conditions of proper use, but actually one of them was not benign. The patch test simply had not mimicked the use conditions sufficiently closely. The same preparations were given the use test that we would so strongly recommend, by other groups of individuals for a three-week period between the initial and final closed patch tests. The materials were cosmetic and dermatological preparations, therefore, the use conditions demanded both normal individuals and patients with dermatoses. Table III, page 842, shows what incorporation of use conditions into the prophetic patch test procedure can do. The test individuals actually used the various preparations in recommended manner for three weeks. Then two weeks after cessation of use they were given a challenge patch test to elicit sensitization potentials. In the columns which show the reactions observed during use, of particular note are the 19 individuals of the 71 given ointment Z, who showed exacerbations of their lesions while using the ointment. The final challenge patch test, given two

(*Continued on page 842*)

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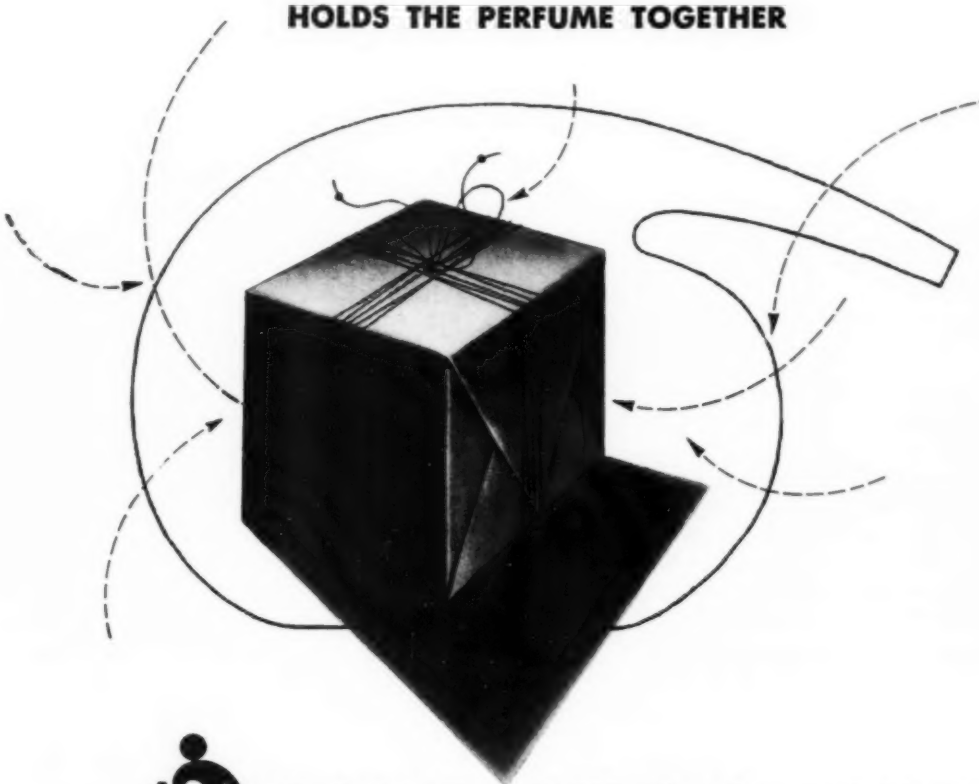

Polak's Frutal Works, Inc., Middletown, New York

*Domestic and Foreign Patents applied for.

(Continued from page 840)

weeks after the use test was completed, confirmed the sensitization potential of ointment Z, the organic sulfur containing product.

Thus, to combine it with a use test is in our opinion the best way to extend the range of the patch test. We have recently used another effective approach. A

PATCH AND USE TEST — HUMANS
(Traub - Spoor)

Test Material	No. & Type Individual	% Positive — Initial Patch	Reactions 3 week use	% Positive — Challenge Patch
Lotion A	74 normals	1.5	1-vesicular irritation 1-mild erythema hands, arms	0
Lotion B	76 normals	3.0	2-erythema & dryness hands & wrists	0
Lotion C	81 clinical dermatologic	15.	1-erythema & pruritis 2-vescular reaction 3-infections secondary to occlusion	12.0
Ointment X	50 normals 14 known reactors to X	2.0 7.0	2-axillary adenopathy 4-axillary adenopathy 3-irritation of axillae	0 14.0
Ointment Y	100 acne	10.	3-irritation and aggravation of condition	12.0
Ointment Z	71 seborrhea & acne	1.4	19-flare up of lesions	12.5

Table III. Patch and Use Test (Lotions and Ointments).

very well-known and respected ointment product had its formula modified to enhance permeability. Presumably, the new formula was as bland as the old, and conventional patch tests were reported to have shown this. In use, the material had caused trouble, particularly when applied to irritated skin. Apparently some chemical in the preparation was more irritating to the true skin than it was to the epidermis. To test this premise, we intentionally scarified the skin, then ran simultaneous patch tests on the intact and injured skin. The data obtained from 50 individuals of the test panel is shown in Table IV. The behavior difference is striking.

MODIFICATION OF TEST SITE
(50 Individuals)

	Old Ointment		New Ointment	
INTACT SKIN	Test	Retest	Test	Retest
Erythema	0	5	5	12
Erythema & edema	0	0	0	0
	Old Ointment		**New Ointment**	
SCARIFIED SKIN	Test	Retest	Test	Retest
Erythema	1	1	26	16
Erythema & edema	0	1	17	26

Table IV. Modification of Test Site.

The new formula material was apparently both irritating and sensitizing to the abraded skin. This explained the trouble it had caused in use.

Having acquired the data, at this point we should discuss the statistical validity of the results of patch tests of this type. Actually even with the recommended panel of 200 individuals if they were patch tested and showed no reaction it would only mean that there would still be a 95 per cent likelihood that there might be quite a high incidence of reactions in the general population, i.e., as high as 1.5 per 100 persons. Obviously, if one were to rely upon statistics, pretesting would be rather impractical. It has been determined mathematically just how many individuals should be tested in a given panel and these conclusions are shown in

STATISTICAL CALCULATIONS
Maximum Anticipated Reactions in General Public
from analysis of
Prophetic Patch Test Data

Test Population (sample size)	Number of Positive Reactions in Test		
	None	One	Two
30,000 individuals	0.01 per cent		
10,000	0.03 per cent	0.05 per cent	0.06 per cent
5,000	0.06 per cent	0.09 per cent	
1,000	0.30 per cent	0.45 per cent	
200	1.5 per cent	2,2 per cent	2.9 per cent
100	3.0 per cent	4.4 per cent	5.8 per cent
50	5.8 per cent	8.8 per cent	
20	13.9 per cent	20.8 per cent	27.0 per cent
10	26.9 per cent	38.2 per cent	

Modified from Henderson, C. R. and Riley, E. C

FIG. V. Statistical Interpretation Patch Test to General Population.

Figure V.[4] Here the maximum anticipated number of positive patch test reactions in the general population has been calculated in terms of negative, 1 plus and 2 plus positive patch tests in a sample population of given size. The samples range from 30,000 to 10 individuals and as is seen, the anticipated number of reactions from a completely negative patch test series, range from 0.01 to 26.9 per cent respectively. The answer here is that one never attempts to interpret patch test data purely statistically. Irritation and sensitization studies are *comparisons* which must always be controlled by simultaneous trial of a similar agent that has been in use over many years.

Another major objection that has been raised to the use of experimentation on human skin, is the individual variation in skin response. For example, it has been shown that those individuals with eczema or the individuals who have a tendency to acquire eczema apparently become sensitized much more readily than do those with normal skin. The instance of sensitization is almost double in the diseased skin. Data on this point, originally presented by Sulzberger[5] is shown in Figure VI. Referring back to our own work on the

(Continued on page 848)

INCREASED SUSCEPTIBILITY TO SKIN SENSITIZATION
OF THE INDIVIDUAL WITH ECZEMA

Sensitizers
(A) P - Nitro dimethyl enaline
(B) 2.4 dinitro chloro benzene

Dermatological Status	Number of Cases	Induced Sensitization		
		To either A or B	To both A & B	To neither A or B
Eczema Patients	36	91.6%	50.0%	8.3%
Non-Eczema Patients	46	53.7%	12.2%	46.3%
All Subjects	82	61. %	25.6%	39.0%

Data modified from
Sulzberger, M.B.

Fig. VI. Increased Susceptibility to Sensitization of Skin of Individuals with Eczema.

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* *The Dispensatory of the United States of America, 1950 Edition*

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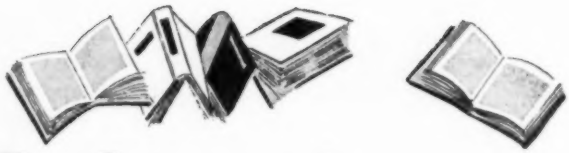

Industry's Books...

Scent Therapy, an Inquiry into the Possibilities of a Method of Therapy of Psychic Disturbances Through Scent, *by Emery Stern, Pe Ce, EE., Member New York Academy of Sciences, Paper, Psychological Library, New York,* **50c** Mr. Stern is a practicing engineer, connected with the City of New York. A long time student of psychology, especially in its experimental phases, after extensive investigation, he is convinced of the practicality of the employment of scents in psychotherapy. He presents his views in this paper.

Rare Metals Handbook, *Edited by Clifford A. Hampel, Chemical Engineer, 657 pp., Reinhold Publishing Corp., New York, (1954), Cloth,* **$12.** Here is the latest available data on more than 35 less-common metallic elements, previously little investigated but now playing an increasingly important role in modern technology. Information about each element is arranged for speedy reference to such important aspects as occurrence, production statistics, economics, derivation, physical and chemical properties, fabrication techniques, alloys, and applications. All chemists, metallurgists and engineers dealing with the production or application of any of the newer metals will find the information contained in this book of great value in their daily work.

Volume II Manual for Plastic Welding Polyethylene, *by G. Haim, Rediweld Ltd., Crawley, Sussex, and J. A. Neumann, American Agile Corp., Bedford, Ohio 128 pp., Illus., The Industrial Book Co., Cleveland (1954), Cloth,* **$6.** This manual is confined to gas welding, of plastics and its applications. It was compiled to give the practical man all the information which he requires to become an efficient welder of plastics. There are several books dealing with the welding of plastics, but these were written for engineers and research workers and therefore contain much information which is of no use to the practical welder; on the other hand they do not contain sufficient information to the man who wants to become a plastic welder. During the past few years gas welding of plastics has been applied with particular success to a large and increasing variety of constructions. This manual should be valuable to practical welders and by engineers who intend to incorporate plastic materials into their designs.

Titanium and Titanium Alloys, *by John L. Everhart, Associate Editor, Materials & Methods, 184 pp., pocket size, Book Div., Reinhold Publishing Corp., New York, (1954), Cloth,* **$3.** In the few years since titanium became a commercial metal, hundreds of papers have been published dealing with the metal. These papers are scattered through the transactions of a number of scientific and technical Societies and through many business publications. It is the purpose of this book to present a selective review of the work covered in these publications and to supplement it with information obtained from the producers of the commercial materials.

The Technical Report, Its Preparation, Processing and Use in Industry and Government, *Edited by B. H. Weil, Manager of Information Services Research and Engineering Department, Ethyl Corp., and 23 contributing authors, 485 pp., Reinhold Publishing Corp., New York, (1954), Cloth,* **$12.** All phases of the technical report, from detailed analyses of its functions to report retrieval and re-use, are full treated in this book. This volume delves into the fundamentals of editing, illustrating, duplicating, binding, distribution, security, filing and putting report files to work. All aspects of writing are carefully surveyed, with emphasis on successful procedures and on specific types of reports—the progress report, the formal report, the market survey, the literature summary, etc. This book should have an especial appeal among writers, technical editors, graphic arts groups, librarians, research and technical personnel connected with technical communications, and all those concerned with the preparation and use of reports as a prime means of information transfer.

Black's Medical Dictionary, *by John D. Comrie, A.A., M.D., Late Physician, Royal Infirmary, Edinburgh, and William A. R. Thomson, M.D., 21st Ed., Illus., 1012 pp., Adam and Charles Black, London, (1953), Cloth,* **$7.** *(Distributed by MacMillan, New York.)* Among many new references and articles now added to this new edition, are those on ACTH, antabuse, dextran, fluorine, ion exchange resins, isonicotinic acid hydrazide, procaine amide, and rice diet, terramycin, and thiacetazone. Planned to give authoritative information in intelligible language upon medical subjects of importance and general interest, this book stands somewhere between a technical Dictionary of Medicine and a guide to the domestic treatment of the commoner ailments. Its widespread and continuing success is due to the accuracy and accessibility of its information and advice, and the frequent and thorough revision which keeps it up-to-date. It is being relied upon increasingly by nursing and medical students and practitioners, in schools and institutions, in more and more departments of industrial and public life, and as an invaluable adjunct to the family medicine cupboard and first-aid box.

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Readers' Questions . . .

Liquid Lipstick: *We are in the lipstick manufacturing business and recently we have heard of a liquid lipstick that stays on the lips for long periods of time. Can you give me information on these liquid lipsticks?* MEXICO.

As far as I know, products of this sort are based on suitable solutions of various cellulose derivatives. As I have pointed out on previous occasions in this magazine, one series of products of this kind is covered by the patent issued to M. Klimist. In U.S. Patent 2,230,063, he suggests the following as a typical preparation for a liquid lipstick that will persist for a long time:

Ethyl cellulose	**3.1 per cent**
Ethyl alcohol	**68.4 " "**
Petroleum ether	**20.0 " "**
Hydrogenated methyl abietate	**7.5 " "**
Rhodamine	**1.0 " "**

Black Hair Rinse: *I should like to have a formula for a black hair dye in powder form. Such a hair dye should provide color lasting for fifteen to twenty days when applied to the hair. It must be quite harmless.* COLOMBO.

What you have in mind is a hair color rinse. Products of this sort are described in Thomssen's text, from which is taken the following formula for a black color rinse:

D & C black No. 1	**80 ounces**
D & C red No. 13	**12 ounces**
D & C brown No. 1	**8 ounces**
Tartaric acid USP	**400 ounces**

Use 30 grains to 1 gallon of water and package accordingly.

Tobacco Stain Removers: *We would greatly appreciate formulas to remove cigarette stains from the fingers.* CHICAGO.

A fairly simple solution for removing nicotine and tobacco stains from nails and fingers consists of 25 per cent of sodium sulfite in water. Another simple preparation consists of:

Citric acid	**10.0 parts**
Glycerine	**5.0 "**
Alcohol	**15.0 "**

A more complicated nicotine remover, consists of:

Beeswax	**10.0 per cent**
Paraffin	**5.0 " "**

Mineral oil	46.0	"	"
Pumice	8.0	"	"
Borax	0.5	"	"
Water	30.0	"	"
Perfume	0.5	"	"

Electric Preshave Lotion: *May I have your suggestion for a lotion to be used before shaving with an electric razor?* EL PASO.

Preparations of this sort are based essentially on alcohol, plus a small amount of an astringent. A simple preparation of this sort calls for:

Alcohol	50.0	parts
Water	50.0	"
Aluminum chloride	0.5	"
Color and perfume	sufficient	

According to Harry, a lotion of this sort may consist of:

Alcohol	70.0	per cent
Lecithin	0.5	" "
Wetting agent	1.5	" "
Witch hazel extract	28.0	" "
Perfume	sufficient	

Chlorophyll Mouthwash: *I am interested in obtaining a formula for a mouthwash containing chlorophyll. Since these products do not enjoy a big sale in this market, it is important that the product be stable for a long period of time and also that it maintains a good appearance.* MONTEVIDEO.

I think something along the following lines should serve your purpose:

Potassium-copper chlorophyllin, water-soluble	0.20	per cent
Alcohol	15.00	" "
Polysorbate 80 U.S.P.	0.50	" "
Flavor oils	0.10	" "
Saccharin sodium	0.01	" "
Water, to make	100.00	" "

Allow to age for two weeks and filter.

Thioglycolate Depilatory: *Can you give me information on the manufacture of depilatories based on thioglycolates? A typical formula will be greatly appreciated.* BROOKLYN.

It is my impression that depilatories of this class are controlled by U. S. Patent 2,352,524 granted to Ralph L. Evans and Everett B. McDonough in 1944. A typical formula cited in the claims of this patent is as follows:

Strontium hydrate	50.0 Gm.
Calcium oxide	12.0 Gm.
Colloidal clay	102.0 Gm.
Methyl cellulose	11.0 Gm.
Thioglycollic acid	12.0 cc.
Water	300.0 cc.
Perfume	0.8 cc.

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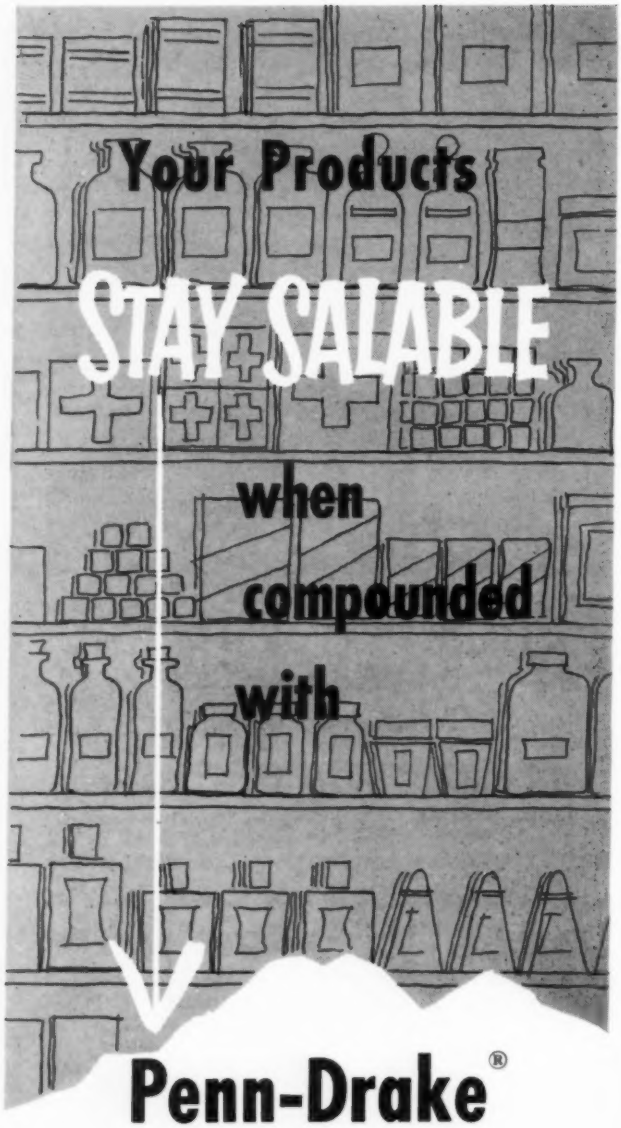

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(Continued from page 842)

combined use and patch test, it will be recalled that we too have shown that the diseased skin becomes sensitized much more readily than the normal.[6] Another factor that cannot be discounted is that an ingredient which may show no signs of being an irritant or sensitizer when presented in one vehicle becomes quite a noxious agent when presented in another. Most frequently this difference in behavior can be attributed to damage of the intact skin due to either solvent irritation or direct penetration. The difference in irritability of the epidermis and the dermis was clearly shown by our work on the abrasion patch test. Manufacturers often neglect this influence of the vehicle. Simple change of an ointment base from petrolatum to one of the newer polyethylene glycol-carbowax types may greatly affect the irritating power of the active ingredient. The well known agent, salicylic acid can be as active or more so at one or two per cent concentration in carbowax as it is in six per cent concentration in petrolatum.

It might also be well to point out the peculiar behavior of some nail polish undercoats. These appeared to be safe on ordinary testing but on use trouble developed. The undercoat was designed to penetrate the nail plate and apparently it did this rather effectively so that in some instances an allergic response occurred causing an inflammatory response with hypertrophy, separation from base and partial to total destruction of the nail in advanced cases. Even in retrospect it would be difficult to devise any pretest that would have indicated this possibility except a use test of such long duration as to have been unfeasible. It is interesting that the undercoat probably by virtue of its penetration acted locally on the nail base whereas nail polish rarely affects the nails or nail base except for a rare case of paronychia. Nail polish usually causes reactions at distant points chiefly the eyelids, neck, etc. where contact dermatitis develops. In the case of shampoo where blindness occurred, pretesting the eyes of experimental animals would in all probability have uncovered this untoward effect and steps could have been taken to prevent the disaster.

The last phase of experimental study to be considered is systemic toxicity. The animal toxicologist must bear the burden of these studies but even he cannot state that when the material is applied to the human skin that it will not be absorbed or that there will not be human idiosyncrasies accompanying this absorption. At this time we cannot predict what the cumulative effect of any presumably perfectly bland agent will be when it is used for long periods of time, but we would like to emphasize the great value of carefully kept records. As an illustration of the value of such records, Figure VII shows the reaction rates through the years, obtained from what was formerly regarded as the perfect antibiotic—penicillin. Here, if one follows the development of the skin reaction pattern, the more serious reactions now being seen can be anticipated.

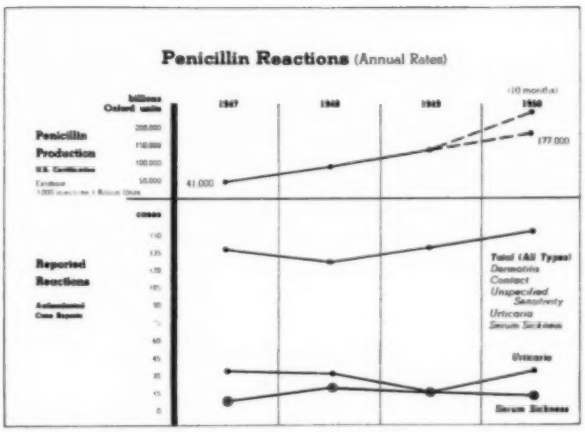

FIG. VII. Penicillin Reactions Types and Rates.

Summary and Conclusions

1. A preparation should be tested not only for its toxicity but also for the effectiveness for the purpose intended. It must be compared directly with any older better known remedy which has served the same purpose.

2. It is not beyond reason to expect to see some suggestion of "do good" behavior of a preparation in the data obtained through toxicological study. We recommend that materials be evaluated for beneficial effects on use programs while the essential data on irritation, sensitization and toxicity is being obtained.

3. A satisfactory evaluation of most chemicals to be used on the human skin can be accomplished by a judicious combination of animal toxicity and screening studies together with human use and patch tests as suggested. Special types of testing may be required in given instances such as eye tests, patch tests on abraded skin vs. unabraded skin, "closed" or "open" patches and so on.

4. The value of all animal experimentation and human use and patch testing is no greater than the experience, judgment and reliability of those doing the tests.

5. It is imperative that the manufacturer recognizes that for each active material there is probably one proper and most effective vehicle, and he should not be coerced into a position of adding the latest miracle ingredient to his entire line. We are thinking specifically of the products G-11 and fractionated chlorophyll derivatives with both of which we have had considerable experience. G-11 is almost the perfect additive for soap solutions; it is much less effective in any other vehicle we have tested.

6. Another point to be borne in mind when embarking on a test program, is whether or not the product will continue to be effective. This is particularly true in the ethical pharmaceutical field and as an example we may state at this time that there has been an apparent diminution in the topical effectiveness of such new drugs as hydrocortisone, several of the antibiotics and isoniazide.

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7. One should be sure that the data obtained is sufficient and proper for meaningful interpretation. We cannot overemphasize the importance of a professionally conducted use test. We highly recommend the combined use and patch test technique as we have employed it, if it is conducted on a large, well-observed panel.

8. With the great majority of cosmetics much penetration is not desirable and absorption is usually to be avoided. This is not necessarily true for pharmaceuticals.

9. Statistics are not as meaningful as the direct comparison with products of known behavior. Measuring the new against the old is essential. The expense of proper pretesting of cosmetic materials, using both the animals and humans, to their maximum capacity is money spent more advantageously than that spent in promotion of a product that later must be withdrawn from the market because it is neither safe nor effective.

10. It would be of great mutual advantage to establish follow-up liasons between the experimentors and testers of chemicals and the manufacturers and final distributors of those products.

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FORTY LITTLE BOTTLES AND HOW THEY FELL

(Continued from page 794)

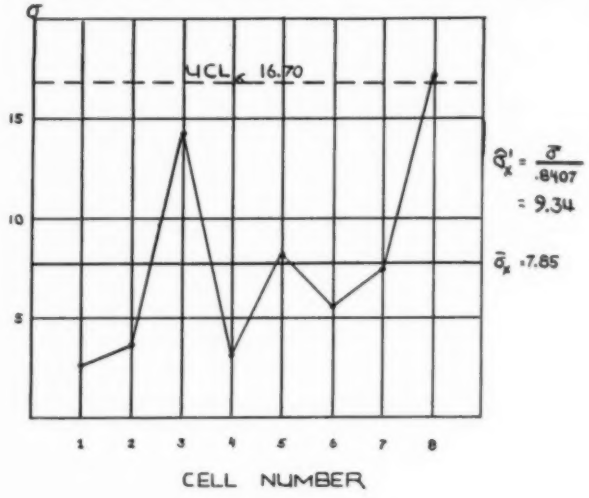
We now ask the important question, "Is the variability in the critical number of drops over this experiment self-consistent?" The control chart in Figure 6 gives a graphical clue to the answer. All but the σ for cell eight fall within the predicted limit of 16.70 and this one is almost certainly exceptionally large, as might be expected. A more elaborate and sharper test[3] fully confirms the conclusion suggested by Figure 6. The eight standard deviations probably are not completely self-consistent. Nevertheless, we use them for predicting a common, overall, estimated standard deviation needed to complete the analysis for the experiment. The estimated value is: $\hat{\sigma}'_x = 9.34$, which is undoubtedly inflated by the σ of 17.30 in cell No. 8.

We have three "main effect" comparisons to make, and four "interaction effects" comparisons. These comparisons require a combination of some four of the eight cell averages to be compared against a combination of the remaining four cell averages for each comparison to be made. We shall need a yardstick to assess the importance of these several comparisons. The yardstick we need is given by:

$$\sigma_\Delta = \hat{\sigma}' \sqrt{\frac{1}{20} + \frac{1}{20}} = 9.34/3.16 = 2.96$$

Figure 6

VARIATION IN σ_x OVER THE EXPERIMENT



If we designate the grand average 11.98 by $\overline{\overline{X}}$, then the limits to be used for judging the importance of the several comparisons will be $\overline{\overline{X}} + \sigma_\Delta$ or 9.02 to 14.94.

The main effects to be compared are: (1) round vs. oval shapes; (2) full vs. 1/3 full contents; (3) 70° F. vs. 130° F. temperature. The average number of critical drops for the round bottles, over all other conditions of test, is the average for cells 1-4; its value is $\overline{\overline{X}}_{\text{Round}} = 9.85$. Similarly, for the oval shape, using cells 5-8, we get $\overline{\overline{X}}_{\text{Oval}} = 14.10$. The average for the "full" level of contents is obtained from cells 1-2-5-7, and turns out to be $\overline{\overline{X}}_{\text{full}} = 7.45$. Using cells 3-4-6-8, we get $\overline{\overline{X}}_{1/3\text{ full}} = 16.50$. The average for the 70° F. effect over all other conditions of test is obtained from cells 1-3-5-7, and turns out to be $\overline{\overline{X}}_{70°} = 14.20$. Using cells 2-4-6-8, we get $\overline{\overline{X}}_{130°} = 9.75$.

"Interaction effects" reflect the *joint* effects of two or more factors rather than the separate effects of these factors. Sometimes two or more variables acting jointly produce a greater effect than any of them separately. The interaction effects we can study in this

TABLE 1—INTERACTION ANALYSIS

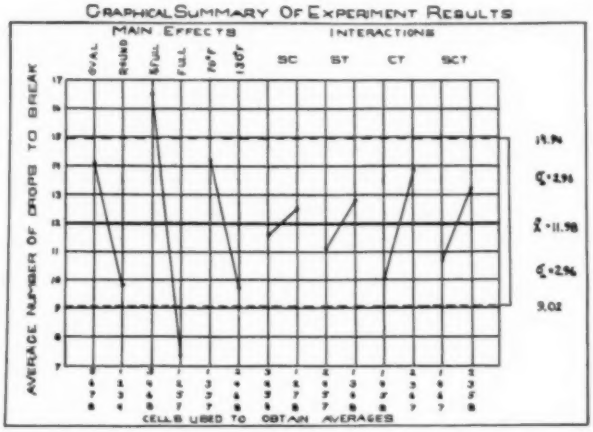
Interaction Effect	Cell Numbers	Average Required
SC	1-2-7-8	$\overline{SC}_1 = 12.55$
	3-4-5-6	$\overline{SC}_2 = 11.40$
ST	1-3-6-8	$\overline{ST}_1 = 12.80$
	2-4-5-7	$\overline{ST}_2 = 11.15$
CT	1-4-5-8	$\overline{CT}_1 = 10.10$
	2-3-6-7	$\overline{CT}_2 = 13.85$
SCT	1-4-6-7	$\overline{SCT}_1 = 10.70$
	2-3-5-8	$\overline{SCT}_2 = 13.25$

experiment are: (1) the shape-contents interaction (SC); (2) the shape-temperature interaction (ST); (3) the contents-temperature interaction (CT); and (4) the shape-contents-temperature interaction (SCT). Table 1 presents the evaluation of these interaction comparisons.

Interpretation and Conclusions

Figure 7 presents the analysis of the results of this experiment in graphical form. On this chart, the lines at 9.02 and 14.94 represent limits, derived from the data of the experiment, that serve as criteria for judging the importance of each comparison shown. A span between any two comparisons that lies within these limit lines means that the difference between the averages compared can be regarded as a sampling fluctuation. A span between any two comparisons that cuts across these two limit lines means that the difference between the averages compared is greater than can reasonably be explained as a sampling fluctuation. Moreover, these limit lines are set so that this latter

Figure 7



statement has associated with it a five per cent risk, i.e., in judging as significant a comparison that cuts across these two limit lines, we can expect to be making an incorrect judgment about one time in twenty. Likewise, we shall rarely be wrong in judging as not significant a comparison whose span lies between these two limit lines. The experiment can therefore be expected to pick up as significant any average difference between effects being compared that is as much as six drops, since 14.94 minus 9.02 equals 5.92. (We anticipated a difference of five drops as significant).

We may not state the conclusions available from this experiment:

1. None of the interactions is significant—no combination of any two (or three) of the factors involved affects the resistance-to-breakage of these bottles beyond what could be expected by chance.
2. The only factor studied that produces a significant difference in the resistance-to-breakage is the amount of contents in the bottle. The bottles—regardless of shape or environmental temperature—

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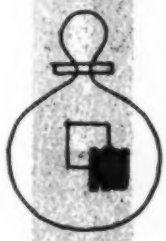

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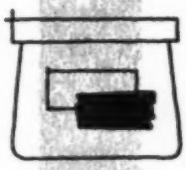

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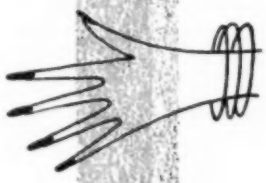

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resist breakage under this drop test better when 1/3 full than when filled to labeled volume.

2. Bottle shape (round vs. oval) is not a significant factor affecting resistance-to-breakage, although over the two levels of fill and the two temperatures used, the oval shape averaged about 4½ drops better than the rounds.
4. Environmental temperature is not a significant factor affecting resistance-to-breakage, although over both bottle shapes and both levels of fill, the 70° F. averaged about 4½ drops better than the 130° F.

So much for the experiment itself. We now know that so far as round and oval bottles are concerned, the only factor studied which has any significant influence on their resistance-to-breakage under this drop-test procedure is the amount of contents in the bottle. Both bottles at either temperature are "safer" when 1/3 full than when full. There is some indication that the oval bottle may be "safer" than the round, and that 70° F. is a "safer" temperature than 130° F., but the evidence supplied by this experiment is not conclusive on these two factors.

It remains to answer the question, "How do these bottles compare with beverage bottles on the question of resistance-to-breakage under this standard drop-test?" The question virtually answers itself! There is no variation in the performance of the beverage bottles —they all break on the first drop. The average number of drops to break for the forty cologne bottles is 11.98. If the cologne bottles really are no different from beverage bottles with respect to resistance-to-breakage under this drop-test, how likely is it that forty of them would average 11.98 when the expected value is 1? To answer this, we are required by the laws of probability governing this sort of situation to make the calculation:

$$z = \frac{(11.98 - 1)\sqrt{40}}{9.34} = 7.43$$

and refer this result to a probability scale known as the "normal" law. At z = 3, the probability is 0.00135. Very few available tables carry these probabilities out as far as z = 7.43 because they are so fantastically small. We can be very certain that the performance of these cologne bottles, measured against that of beverage bottles, is definitely *not* a sampling fluctuation.

If a beverage bottle that consistently breaks on the first drop under this test can still be accepted as a "safe" article, then these cologne bottles, measured against the same standard, build up a record which requires us either to reject the contention that they are no "safer" than beverage bottles, or to admit that we have actually witnessed a miracle!

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SEVERAL ASPECTS OF ANTIBIOTICS

(*Continued from page 766*)

admittedly due to difficulties in interpretation of results,[40] re-infections from uncontrolled cases which may give a false picture of efficacy,[43] and lack of satisfactory comparison data,[73] the extremely high incidence of amebiasis in many tropical countries warrants the continued studies; either with single antibiotics or with combinations of an antibiotic with a chemical amebacide.

Bacitracin in Amebiasis: Bacitracin is one of the antibiotics which has been found inhibitory and lethal against *Endamoeba histolytica*, when administered orally in the treatment of intestinal amebiasis, a few of the advantages being: (a) It is not readily absorbed. (b) It is better tolerated than other antibiotics. (c) It is not toxic when used orally, even for long periods of time; for instance, no blood levels are demonstrable with its oral use.[5,51,39,15,17,44,236]

The oral use of bacitracin is limited to intestinal amebiasis because, being scarcely absorbed from the gastro-intestinal tract, it would not be expected to be effective against amebic hepatitis by the oral route of administration.[18] However, this still maintains the antibiotic within a high realm of importance because intestinal amebiasis is the most prevalent form.

Clinical studies with bacitracin were conducted on the one hand[15] on patients returning as war veterans who had acquired their infestation in widely separated areas, and treated with the drug upon their return to the United States where re-infestation from outside sources was unlikely; and on the other hand[52] on patients in whom the problem of follow-up was more difficult because of the possibility of re-infestation from outside sources.

In the first instance, excellent clinical response was obtained, in both acute and chronic cases; employing total daily doses of 40,000 to 100,000 units, in tablet form.[15] In the second instance, good results were also obtained, when doses as large as 250,000 units daily were given without evidence of toxicity.[52]

Other investigators, employing bacitracin as the sole amebacidal agent, have recorded cure rates of 80 per cent in twenty-two cases treated, mostly employing an oral dosage of 60,000 units a day for five days.[18] Another clinician[44] obtained good results with daily doses ranging between 50,000 and 100,000 units, and he noted that apparently no toxic effects were reported even when the drug was administered for long periods of time. With the 100,000-unit dosage in a limited series, this investigator felt that results were equivalent to those obtained with some of the iodoxyquinoline derivatives.

During the past several years, still other instances of studies with bacitracin as an amebacidal agent were reported, with generally good and promising results.[53,54,55,56]

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days, bacitracin was found to have a cure rate of 73 per cent in 11 cases treated[23,36]. Comparatively, bacitracin's percentage cure rate was better than other antibiotics, such as penicillin, aureomycin, neomycin, streptomycin, chloramphenicol, polymixin, fumagillin, magnamycin; better than combinations, such as penicillin and sulfasuxidine, "penicillin and sulfasuxidine than emetine and diodoquin," "penicillin-sulfasuxidine-emetine-diodoquin simultaneously;" and better than chemical agents used singly, such as emetine, diodoquin, carbarsone, yatren and sulfasuxidine.

It has been said that satisfactory comparison of antibiotics in amebiasis is not available, inasmuch as *in vitro* results are not often applicable to clinical work. For instance, in commenting on comparative studies of bacitracin in amebiasis, with two other antibiotics, it was pointed out that while it might not appear from one set of results obtained, that bacitracin used as the sole amebacide is statistically not quite as good as the other two antibiotics tested, the difference is not great; and that in order to make more accurate comparisons among the antibiotics, long-term studies of these agents in larger groups of cases is needed.[18]

In the meantime, especially since amebiasis requires relatively long duration of therapy and is a diarrheal disease, the problem is made more complicated when the treatment is carried out with agents which themselves frequently produce diarrhea.[44]

Bacitracin Combined with Chemical Amebacides: It has been said, particularly by clinicians who have specialized in the field of tropical medicine, that no one drug is a successful and complete amebacide.

There is evidence that combined antibiotic-chemical therapy may be more efficient than any antibiotic alone, because of the distinct difference in mode of action and therapeutic limitation.[57]

The combination of bacitracin with a chemical amebacide is viewed as having a potentially bright future in the treatment of amebic dysentery.

As a typical combination, bacitracin plus diodoquin or other synthetic amebacide is recommended.[18] This favorable view toward diodoquin is consistent with other clinicians in tropical medicine, because this chemical is considered to be the least toxic among the iodine compounds that have been employed in amebiasis.[44,57]

Among the arsenic compounds, carbarsone has been used widely, as well as other such compounds.

Consequently, it has been recommended that bacitracin be re-evaluated for its individual merit, because this antibiotic is better tolerated than other antibiotics that have been employed in amebiasis; and it is *specifically* recommended that this antibiotic be re-evaluated in *combination* with certain chemical amebacides.[18]

It has been suggested that antispasmodics could be combined with amebacidal agents, so that amelioration of some of the problems of altered motility can be achieved; thereby assisting not only in relief, but in

better interpretation of symptoms.[44] Therefore, conceivably, an antispasmodic would be a worthwhile addition to a bacitracin amebacidal product.

Bacitracin Combined with Chemical Parasiticide: Bacitracin has also been suggested in combination with other synthetic chemicals, for internal treatment of pinworms, *Enterobius vermicularis.*

For instance, the antibiotic combined with sulfasuxidine is said to be more effective in removing the stubborn parasites than either agent employed alone. With a daily dosage of 10,000 units of the antibiotic and 500 mg. of the sulfa drug, per 10 pounds of body weight, a cure rate of 91 per cent was obtained in seven days of treatment.[58]

Vehicles or Bases: Various product bases have been used in which to incorporate bacitracin depending, of course, on the method of administration or application, or the use intended. Pharmaceutical manufacturers usually employ bases of their own development, or those they have found satisfactory in their experiences.

Bacitracin has been employed in various kinds of pharmaceutical products, including ointments, tablets, lozenges, vials (dry forms for topical use), ampuls (sterile dry forms, for reconstituting and using parenterally), nasal preparations (dry forms to be reconstituted), vaginal suppositories, etc.

Comments on some of the more important types of preparations are tabulated in the literature; i.e. ointments,[20,16,32,27,14] water-miscible bases,[5,32] lotions,[22] and tablets or lozenges.[19,21] However, the literature sources do not always give quantitative or qualitative formulas for these bases.

Petrolatum was employed apparently as the sole base, in an ointment used to treat pyodermas and also to test patients for allergenicity,[20] incorporating bacitracin to the extent of 1000 units per gram of base. The clinicians noted that, even though the miscibility of their greasy ointment with the watery exudate of impetigo contagioso was poor, the curative effect was rapid. They also contrasted the rapid effectiveness of bacitracin incorporated in petrolatum with that of other antibacterial agents; pointing out that ammoniated mercury, for example, may be ineffective in petrolatum.

Others have also used a petrolatum base ointment for bacitracin, in a large series of patients treated for a variety of infected primary and secondary dermatoses.[27]

White petrolatum was used as the base for ophthalmic ointments containing bacitracin in varying concentrations, with preference for 1000 units of bacitracin per gram of base.[16]

A "special low melting petrolatum base" was used in an ointment containing 500 units of bacitracin per gram, but the base was not further identified.[27]

A petrolatum base was used for an ointment containing 500 units of bacitracin and 5 mg. of neomycin sulfate per gram of base[14]

A "modified petrolatum ointment base" was employed to incorporate a mixture of bacitracin 500 units and tyrothricin 500 micrograms per gram of ointment.[23]

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for use as bases for bacitracin.[5] It was felt that these substances readily released the antibiotic and did not deteriorate at room temperature, compared to a previously used carbowax-propylene glycol base. It was observed that in grease bases bacitracin, while also more stable than in the carbowax-propylene glycol base, was not as readily released.

Among a number of ointment bases studied, the following compound base was found suitable in overcoming the difference in diffusibility, stability, and drug release, in a combination bacitracin-polymixin product: liquid petrolatum, a polyhydric alcohol fatty acid ester (glycowax S 932), polyethylene glycol 400 distearate, and polyethylene glycol 400 dilaurate.[59]

A dry-form water-soluble base, which is reconstituted before use with water, was designed to overcome the occlusive effects of some ointments.[22] It was said that this base, which consists of a mixture of carbowax, veegum, sorbitol, and lecithin, permits the free discharge of the exudate and the transudate that usually accompanies widespread skin infections. When the base is reconstituted with 55 ml. of water, each ml. contains 500 units of bacitracin and 10,000 units of polymixin.

In addition to the bases or vehicles specifically mentioned above for bacitracin, it is possible that some of the useful ointment and ointment-like bases employed for sulfa drugs in the past, would be adaptable for use with the antibiotic; especially those bases of the non-aqueous type.[60]

Some investigators have employed bacitracin in an aqueous vehicle, for extemporaneous preparation and use.[5,16] Application of a solution containing 500 units per ml. to infected wounds or ulcers often caused rapid disappearance of the infecting organisms and subsequent wound healing.[5]

A solution containing 1000 units per ml. of bacitracin made by adding either sterile distilled water or sterile isotonic saline solution to the drug, is said to be both effective and non-irritating for local instillations; and it is stated that such a solution will retain its potency for about a week even without refrigeration.[16] This same clinician has used a combination of 500 units per ml. of bacitracin, in two per cent procaine solution, for small local infiltrations into tissues of the eyelids.

There are probably no literature references tabulating bases used in the preparation of bacitracin tablets, troches, pastilles, and similar compressed forms. However, for the pharmaceutical manufacturer, such products are relatively easy to prepare, and the customary bases employed in compressed forms of pharmaceuticals are usually satisfactory. Proper pharmaceutical technics, including protection against moisture and excessive heat, usually result in stable forms; especially if such protection is given to the storage of bulk bacitracin prior to use in compounding, as well as similar protection during formulation and packaging.

In the regulations pertaining to certification of bacitracin products, the Food and Drug Administration

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limits the moisture content to a maximum of five per cent for tablets. In plain tablets, without the presence of flavoring oils, good stability results.

This is not to say that tablets or troches prepared with flavoring oils necessarily contribute to bacitracin loss of potency. In fact, most flavoring agents are suitable. However, it is known that certain essential oils may hasten the deterioration of medicinal agents, and perhaps this could happen with bacitracin, especially if such oils undergo changes on standing.

Combining of Antibiotics: The reasons for judicious consideration of antibiotic combinations, or combinations of antibiotics with certain chemicals, are rather obvious; especially when dealing with a *variety* of microorganisms involved in an infectious process.

This view is a generally reasonable one for *mixed* infections, although we are sometimes reminded that there is little objective evidence that combinations are more effective in a *specific* infection than a single component. If the infectious process is known, those that hold with this latter view contend that the single antibiotic sometimes can be selected on the basis of experience or rapidly determined in the laboratory, and that combinations should be used only when the organism proves resistant to single medication by actual test or trial.[61]

However, specific therapy often implies specific diagnosis by laboratory means; but even though culture studies and other tests to determine the identity of the offending organism approach the ideal, these are not often practical in the physician's office practice.[62-67]

Consequently, the use of more than one antibiotic at the same time has become a general practice,[61] with the realization that certain infections cannot be cured by one agent alone, and also with the view that in some severe infections it is better not to postpone treatment to await exact determination of the etiologic organism.[63] This is, of course, a major reason for the acceptance and popularity of certain antibiotic combinations presently on the market as pharmaceutical products.

There have been some efforts to compare the antimicrobial activity of single antibiotics with that of combinations. For instance, attempts have been made to interpret the results of *in vitro* tests and their correlation with *in vivo* observations, as well as the dynamics of a combined antibiotic synergism and antagonism.[64]

Attention has been called to the consideration of methods for experimental design as used with drugs[65] other than antibiotics, with the hope that statistically unequivocal results would be obtained; but so far such methods have not been applied to the exhaustive investigation of combined antibiotic action. It would seem that investigations in testing such combinations, at least up to within a year or so ago, have not yielded any simple, practical methods of testing mixtures of antibiotics in the clinical laboratory.[61-64]; especially in attempting to demonstrate or confirm synergism.

There is no doubt that the subject of combined antibiotic drugs is a complex one, that such experimental

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analysis is in its infancy, and that testing methods employed and interpretations made may vary among different investigators. Conflicting reports have centered around such points as investigational methods, definition of terms, significance of results especially in the correlation between laboratory and clinical findings, speculations on modes of action, and so forth.[84]

One clinician, in expressing his views on the inadequacies of evaluating antibiotics in general, stated that we are probably throwing away some of our best antibiotic agents because we lack adequate technics of (this aspect of) bioassay.[238]

These views point to the need for care and proper perspective in the decision to combine antibiotics, which drugs to combine, and why a particular combination is or is not feasible. The same is true in the consideration of combining an antibiotic with other chemicals and drugs. *(To be continued next month)*

PATENT THOUGHTS AND TRENDS

(Continued from page 797)

wherein R_1 and R_2 are the same or different alkyl radicals having not more than a 2 C-atoms each, while N = Z is a radical of the group obtained by removing 1 N-attached H-atom from ammonia, a primary or secondary alkyl amine, morpholine and piperidine, the alkyl radicals in the said alkyl amine containing not more than 4 C-atoms each. Following usage in the literature, the above compounds may be designated as alkyl derivatives of thiocarbamo-sulfonamides.

The recommended concentrations of the bacteriastatic agent are from 0.5 to 5.0 per cent by weight based on the weight of the cleansing composition. N,N-dimethyl-thiocarbamo-sulfonamide is one of a number of specific anti-bacterial agents mentioned in the patent.

MANICURE PREPARATIONS

(Continued from page 761)

been used for many years, is still a favorite. Competing with the natural resins, however, are many synthetic resins, principally the methacrylates, and since they are capable of being synthesized in any of a large number of polymetric forms they may eventually displace the natural resins completely. Their concentration in the lacquer is dependent on the amount of plasticizer used, and therefore the range is rather great. Generally, they are used in from 50 to 100 per cent of the nitrocellulose concentration.

Colors used in lacquers are usually the bright insoluble lakes, used frequently in conjunction with titanium dioxide, iron oxide colors are also sometimes used but not primarily to impart a coloration to the film. Lacquer manufacturers have done a remarkably good job in dispensing colors and titanium oxide so that the amount of settling over a long period of time is very small. To attain this degree of stability the

titanium dioxide must be ground to an extremely small particle size. In the regular commercial process however, there is perhaps about five per cent of the titanium oxide with a greater than optimum size and this portion settles rapidly. Since titanium oxide is so extremely opaque, it causes the separation to appear much worse than it really is from a purely quantitative standpoint. One method of detracting from the bad aesthetic effects of such a separation is to grind into the mixture enough iron oxide pigments chosen so that their shade approximates the shade of the lakes, which will settle at the same rate as does the titanium oxide and therefore keep the separation from appearing to be so defective.

Most lacquers are manufactured by private label houses rather than by the cosmetic manufacturer because of the limitations set on him by the inflammable nature of the ingredients used. In common practice, the colors are ground together with the plasticizer and then added to the remainder of the lacquer. The lacquer itself is then regarded in its entirety. Ball mills are usually used.

Lacquer removers may be made from any of a number of solvents available. The fastest acting seems to be acetone, but because of its high volatility rate, ethyl acetate has come into favor as well. Many of these also contain an additive designed to leave a film on the nail, since the solvent itself has so high a degressing tendency. Among other substances, castor oil is used for this function.

Cuticle remover and cuticle softeners are also in relatively good demand. The usual type is a dilute solution of alkali in water with perhaps some glycerine or other humectant added to keep the water from evaporating too easily. The use of potassium hydroxide —the alkali usually used—has much to be desired because its activity is so harsh but it is effective. It has the further disadvantage of attacking the glass container on long standing causing unsightly precipitates. Attempts have been made to substitute trisodium phosphate and even triethanolamine, but these did not solve the problem. There has also been an attempt to use quaternary ammonium salts which, though not as effective as alkali, do a fair job of softening the cuticle. Quaternary ammonium bases have also been used and they may have some merit. Their advantage may lie in their inherent ability to be substantive to protein and therefore forming a film which would cause the cuticle to be smoother to the touch.

Other manicure preparations are nail-whiting, made usually with titanium oxide incorporated in a suitable base or incorporated into a pencil-like form since this is the easiest method to apply.

Attempts have been made to ease the application method of lacquer to the nails. With the advent of plastics there have been some preformed films designed to be placed on the nail without any need for painting, or waiting for the film to dry. So far these attempts have not been particularly successful but certainly they should not be sneered at either. In my own experience I have noticed that everything else being equal, the

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product which can be applied with a minimum of discomfort or trouble will supplant the competition.

EMULSIFIED LOTIONS

(*Continued from page 767*)

chosen, it should not be used in excessive amounts; one to two per cent is usually adequate. Large quantities of these hygroscopic compounds prevent the cream from drying completely, and also assert a slight dehydrating action on the skin.

Water content will of course vary with the formulation. Too much slows down the rub-in time, and also produces an unstable emulsion. Too little, on the other hand, also an unstable emulsion. As far as purity is concerned, distilled water will give best results. Deionized water can also be used with success. If tap water is to be used, the formulation will have to be modified to some extent to assure stability.

The appearance of the product is of utmost importance. From the practical standpoint, there is no advantage in producing a cream that is not cosmetically appealing. Each individual manufacturer has his own ideas as to what type of product is most cosmetically appealing, and each one is sure that his particular product is the most attractive item of that nature on the market. If these beliefs are justified, this is as it should be. The manufacturer must be sure of his own product in order to effectively market it.

Some manufacturers prefer a colored lotion, while others prefer a white one. Some like a pearl, others do not. With proper formulation, any of these types can be manufactured. If a colored lotion is desired, it must be colored only with certified D & C colors. Usually the colored lotions contain just enough dye to tint the lotion a pastel shade. Pink is most frequently used. However, occasionally blue, green and yellow are encountered. FD & C Red No. 2 is used for pink; tartrazine, FD & C Yellow No. 5, is used for yellow; FD & C Green No. 2 can be used for green; and FD & C Blue No. 1 can be used to produce a blue color. For white, of course, no dye at all is added. However, cetyl alcohol in the formula increases the whiteness of the emulsion.

Pearliness is a phenomenon directly attributable to the ratio of unsaponified stearic acid present in the product. Subsequently, the greater the amount of unreacted stearic acid, the more pronounced the pearliness. This unsaponified stearic acid is precipitated from the lotion and is suspended as a colloid. This pearliness is usually accompanied by slight change in viscosity. Several compounds actively inhibit the formation of a pearl. Large quantities of fatty alcohols, such as cetyl or stearyl, act in this manner, as does mineral oil and many of the glycol ethers. Glyceryl monostearate tends to inhibit the formation of pearl also, but can be used in quantities up to two per cent without ill effects.

The following formulations are excellent illustrations of these emulsified products. Some of them will produce a pearl, while others will not. However, since some manufacturers prefer a pearly cream and others prefer

the regular emulsion, both sides will be satisfied. These creams depend to a great extent upon both the manufacturing technique and the raw materials used, for their suitability. It is suggested that after laboratory approval of a formula, it should be made in a pilot plant batch, under the conditions to be met when it is placed in actual production. This might well save a tidy sum in having to discard a large batch that did not pan out when placed into production. Laboratory results can very seldom be duplicated exactly in the plant. Sometimes the results are better and other times worse. However, an ounce of prevention is worth a pound of cure.

No. 1
HAND LOTION CREAM

Glyceryl Monostearate	3.2 per cent
Isopropyl Palmitate	2.0 " "
Oleic Acid	2.0 " "
Stearic Acid	2.0 " "
Sorbitol	2.0 " "
Triethanolamine	1.0 " "
Preservative	0.1 " "
Water	83.2 " "
Alcohol	4.0 " "
Perfume	0.5 " "

All of the ingredients except the perfume and alcohol are heated together to a temperature of 95° C. Agitate until a cream is formed. Continue this agitation during the cooling period, being careful, however, not to incorporate air. When the emulsion has cooled to 45° C. dissolve the perfume in the alcohol and add it to the emulsion. Stir until all of the perfume is thoroughly distributed throughout the cream.

No. 2
HAND LOTION CREAM

Tegin	4.0 per cent
Glycerine	5.0 " "
Lanolin	2.0 " "
Water	88.5 " "
Preservative	0.1 " "
Perfume	0.5 " "

Follow the same directions for the manufacture of this product as indicated in formula No. 1.

No. 3
HAND LOTION CREAM

Tegin P	5.2 per cent
Oleic Acid	2.1 " "
Isopropyl Myristate	1.0 " "
Stearyl Alcohol	1.0 " "
Lanolin	1.0 " "
2-Amino-2-Methyl-1,3 Propandiol	1.0 " "
Sorbitol	4.4 " "
Preservative	0.1 " "
Water	84.2 " "

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No. 4
HAND LOTION CREAM

Diglycol Stearate	2.0 per cent
Stearic Acid	4.0 " "
Olive Oil	2.0 " "
Propylene Glycol	3.0 " "
Triethanolamine	1.1 " "
Lanolin	2.0 " "
Stearyl Alcohol	0.7 " "
Water	85.2 " "

Melt the diglycol stearate, stearic acid, lanolin, stearyl alcohol, olive oil and preservative together in a suitable container and heat to a temperature of 80° C. Heat the water and propylene glycol to the same temperature. When ready, the triethanolamine is added to the hot water, and the mixture is poured into the molten fats with continuous agitation. Stir until the cream has cooled to 45° C. and add the perfume.

The above cream has a very pronounced pearl. If allowed to age, and agitated from time to time during the aging period, the pearl is enhanced. The cream may be aged from one to two weeks, or longer, if desired.

No. 5
HAND LOTION CREAM

Glyceryl Monostearate	10 parts
Mineral Oil	20 "
Olive Oil	10 "
Cetyl Alcohol	6 "
Butyl p-Hydroxybenzoate	0.2 part
Glycerine	2.5 parts
Stearic Acid	3 "
Water	600 "
Blue Color	q.s.
Perfume	0.2 part

Follow the same directions as in formula No. 1.

No. 6
HAND LOTION CREAM

A	Glyceryl Monostearate	17	Pounds
	Stearic Acid	30	"
	Absorption Base	7	"
	Lanolin	10	"
	Cetyl Alcohol	8½	"
	Mineral Oil	32¼	Gallons
	Olive Oil	4¼	"
	Cottonseed Oil	¾	"
	Propyl Gallate	5	Ounces
B	Triethanolamine	11¼	Pounds
	Butyl p-Hydroxybenzoate	20	Ounces
	Water	177½	Gallons
C	Isopropanol	2½	Gallons
	Water	2½	"
	Perfume	71	Ounces

Heat A to a temperature of 90° C. Run the water into a separate container, add the preservative, and heat it to the same temperature. Add the triethanolamine and pour the hot waxes into B. Stir the cream until it cools to 45° C. Add C and continue stirring until the perfume is evenly distributed throughout the emulsion.

MODERN INSECT REPELLENTS

(*Continued from page 763*)

most effective preparations against several species of *Aedes*. Next in order of effectiveness was the preparation M-2042, consisting of:

2-Ethyl-1, 3-hexanediol	4.0 parts
Propyl N,N-diethylsuccinamate	3.0 "
o-Chloro-N,N-diethylbenzamide	3.0 "

Also included among the effective preparations was a mixture of equal parts of 2-ethyl-1, 3-hexanediol and *o*-chloro-N, N-diethylbenzamide. This composition is referred to as M-2048.

In a series of field tests with mosquito and sand fly repellents in Alaska, Applewhite and Smith[19] found that the following mixture was the most effective:

Dimethyl phthalate	6.0 parts
Propyl N, N-diethylsuccinamate	4.0 "
Indalone	2.0 "
2-Ethyl-1, 3-hexanediol	2.0 "

While such liquid mixtures of repellent chemicals are effective for warding off insects, they often impart an unpleasantly greasy feeling when applied to the skin. It has been found that a cosmetically more satisfactory way of using these chemicals is in an ointment or emulsion base.[20] Goldman[7] mentions that cream vehicles have been suggested by the Orlando, Fla., Laboratory of the Bureau of Entomology and Plant Quarantine. Cold cream and vanishing cream types of bases are preferred and the proportion of liquid repellent in the cream may vary from 10 to 60 per cent.

In discussing the work of the Orlando group, McAllister[21] cites the following experimental formula which they found satisfactory for many of the liquid repellents:

Stearic acid	40.0 Gm.
Potassium carbonate	0.6 Gm.
Glycerine	12.0 cc.
Water	68.0 Gm.
Liquid repellent	80.0 cc.

In tests run by Applewhite and Smith,[19] 25 per cent alcoholic solutions of ten repellents were compared with creams containing 20 per cent of the same compounds. In these tests, the creams were found to be slightly less effective than the liquids. The creams consisted of:

Repellent	20.0 per cent
Glycerine	12.0 " "
Resin blend	5.0 " "
Bentonite	5.0 " "
Water	58.0 " "

In another small series of tests, these workers found that the following proprietary repellent cream gave good results when compared to two liquid mixtures, but gave equivocal results with propyl-N, N-diethylsuccinamate alone:

Dimethyl phthalate	41.4 per cent
Dimethyl carbate	13.8 " "
Indalone	13.8 " "
Zinc stearate	30.0 " "
Bentonite	1.0 " "

Sources other than the entomologic research literature have also provided procedures for making effective insect repellent preparations. For example, the Department of Health for Scotland used dimethyl phthalate, which is an efficient mosquito repellent, as the active ingredient in the following cream[20,21] for washing off midges:

Emulsifying wax	5.0 Gm.
Triethanolamine	9.0 cc.
Oleic acid	27.0 cc.
Dimethyl phthalate	100.0 cc.
Water	100.0 cc.

Another anti-midge cream, also of British origin,[22] may be prepared from:

Stearic acid, triple pressed	30.0 Gm.
Sodium hydroxide	0.3 Gm.
Glyceryl monostearate	5.0 Gm.
Water	15.0 cc.
Dimethyl phthalate	50.0 cc.
Oil of citronella	1.0 cc.

The stearic acid and glyceryl monostearate should be melted together and to them added the hot solution of caustic soda, with constant stirring. While still warm the phthalate is added and finally the oil of citronella. Both should be stirred well in. The consistency of the cream can be adjusted by increasing or reducing the water content, and it may be necessary to add preserving agents.

Rutten[23] has recently suggested the following simple emulsion, which contains a combination of repellents, as worthy of further experiment:

Diglycol laurate	14.0 parts
2-Ethyl-1, 3-hexanediol	8.0 "
Dimethyl phthalate	16.0 "
Indalone	6.0 "
Water	55.0 "

Also containing a mixture of repellent materials, but in lower proportions, is the following more complex but probably more cosmetically elegant insect repellent cream:[24]

Glyceryl monostearate S	1.6 per cent
Cetyl alcohol	4.9 " "
Lanolin	2.4 " "
Light mineral oil	18.6 " "
2-Ethyl-1, 3-hexanediol	1.0 " "

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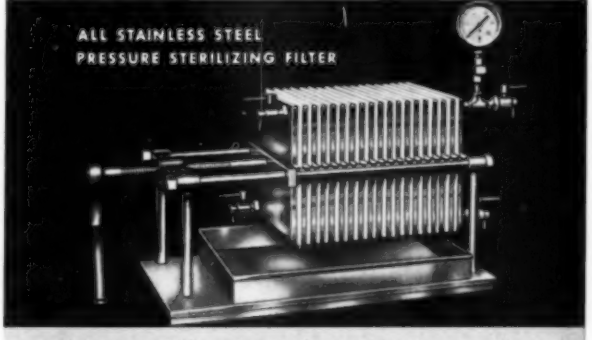

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Indalone	3.0 " "
Veegum*	1.6 " "
Water	59.6 " "
Glycerine	5.8 " "
Triethanolamine	0.5 " "
Preservative	sufficient

(*R. T. Vanderbilt Co, New York, N. Y.)

In considering the use of some of the newer cosmetic raw materials in the formulation of insect repellent creams, McAllister[21] suggests that basic compositions might be built on polyethylene glycols or their derivatives. He offers the following formula to illustrate such a preparation:

Polyethylene glycol 400	12.0 parts
Diethylene glycol monoethyl ether	4.0 "
Isopropanolamine	1.0 part
Stearic acid	11.0 parts
Sodium alginate (2 per cent dispersion)	3.0 "
Dimethyl phthalate	40.0 "
Water	29.0 "

Where a repellent lotion is desired, a water-in-oil emulsion is said[25] to offer a number of advantages, such as longer retention of the protective film on the skin surface and resistance to perspiration. A basic formula for such a lotion consists of:

Insect repellent	10.0 per cent
Mineral oil	23.0 " "
Beeswax	1.0 " "
Sorbitan monostearate (Arlacel 60*)	2.0 " "
Sorbitan sesquioleate (Arlacel 83*)	1.7 " "
Polyoxyethylene sorbitan monostearate (Tween 60*)	1.7 " "
Water	60.6 " "
Preservative and perfume	sufficient

(*Atlas Powder Co., Wilmington, Del.)

The patent literature also offers a number of methods for making improved or novel insect repellent liquids and creams. Quite recently, for example, Kauppi[26] was granted a patent on the use of silicones in the preparation of insect repellent compositions. He had found that the period of insectifugal effectiveness could be greatly prolonged by incorporating an organopolysiloxane in the preparation. Thus, an insect repellent emulsion could be prepared from:

Mixture of 2-phenylcyclohexanol (70 per cent) and 2-cyclohexylcyclohexanol (30 per cent)	59.2 per cent
Dimethyl polysiloxane fluid, 1,000 cs.	6.6 " "
Polyethylene oxide stearate	10.5 " "
Glyceryl monostearate	10.5 " "
Water	13.2 " "

Stressing the fact that a skin area not covered by repellent does not afford protection against insects, one worker[27] has included a colored indicator in his formulas. This serves to show where the preparation was applied

and which areas were skipped, the dressing becoming colorless or imperceptible shortly after application. Typical is a preparation made by blending 10 volumes of 2-ethyl-1, 3-hexanediol, one volume of a 10 per cent solution of phenolphthalein in alcohol, two volumes of glycerine and two volumes of alcohol and agitating with an excess of powdered anhydrous sodium carbonate. Removal of the undissolved solids, yielded a somewhat viscous liquid with a vivid red color. Within a few minutes after application to the skin, all of the color disappeared.

In another instance, Scanlan and Cunningham[28] combined the insect repellents with ingredients that proved a soothing effect for insect bites existing at the time of application. An illustrative example of such a mixture, dispensed in a cold cream base, is as follows:

Beeswax	5.000 parts
Stearic acid	25.000 "
Spermaceti	3.000 "
Hydrogenated rotenone	0.125 part
Mineral oil	20.375 parts
2-Amino-2-methyl-1, 3-propanediol	1.500 "
Glycerine	7.000 "
Phenol	0.500 part
Zinc stearate	0.800 "
Water	50.000 parts
Perfume	0.100 part

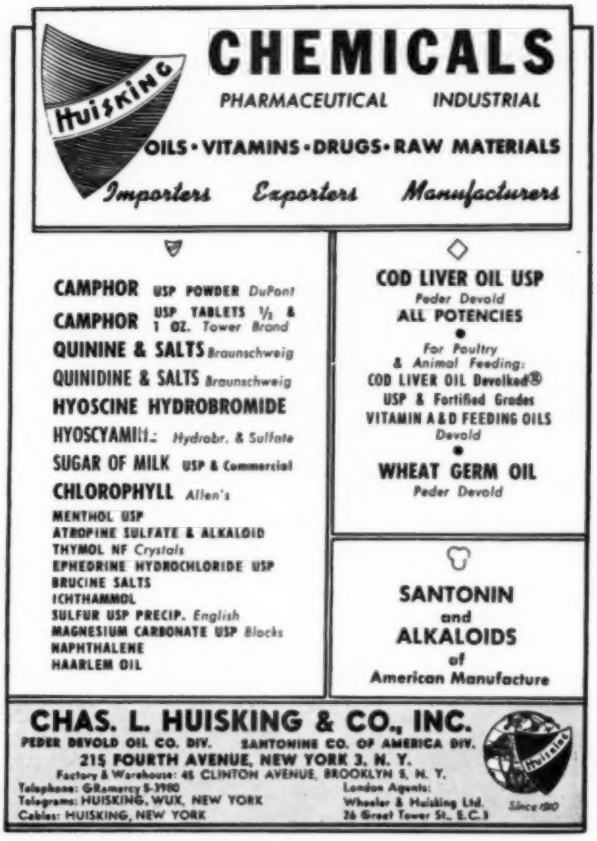
Because of their convenience and other advantages, insect repellent sticks have attained considerable popularity. In discussing the manufacture of such products, Hilfer[29] states that they may be made readily by the soap and alcohol method. In this procedure, the active agents are dissolved in alcohol which is jelled by the introduction of a sodium soap, usually sodium stearate.

Such a procedure is used by Amohundro and his colleagues[30] in their patented method for making insect repellent sticks that are transparent, stable at extremes of normally-encountered temperatures, nonfriable, nonbleeding and easily applied to the skin. Containing a substantial proportion of active agents, a stick of this sort is made as follows:

Dimethyl phthalate	12.2 parts
2-ethyl-1, 3-hexanediol	18.0 "
Isopropyl alcohol (91 per cent)	31.5 "
Sodium stearate, powdered	20.3 "
Glycerine	12.1 "
Water, distilled	3.5 "
Color solution	1.2 "
Perfume	1.2 "

The first three ingredients are mixed together and to this mixture is added the soap, glycerine, water and coloring. The combination is heated from 81° to 82° C., with occasional stirring. When a clear solution is obtained, usually after seven to ten minutes, remove from the heat and allow to cool to 60° C. Add the perfume and pour into molds. Remove from the molds when cooled to room temperature.

Hilfer suggests that it might be advantageous to use



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a nonvolatile medium for formulating the sticks. Thus, the use of certain of the glycol derivatives would yield excellent bases, since they are readily jelled by sodium stearate. He notes that mixtures of insect repellents and sun screens could be incorporated in such a formula to make a combined insectifugal and suntan preparation.

In passing, it may be mentioned that European workers have developed solid insect repellents with other types of bases. In some instances wax bases are used,[31] while for others resinous materials are suggested.[32]

As with other types of personal products, manufacturers have also explored the possibilities of dispensing insect repellents in aerosol containers. Protection from insects at the touch of a valve, they reason, should yield a convenient and salable product. In addition, it is possible to combine a sunscreen with the repellent to provide protection from both sun and insects.[33]

In investigations made by a leading propellent supplier,[34] it has been found that a mixture of 25 per cent insect repellent and 75 per cent of a 50:50 mixture of Freon-12 (dichlorodifluoromethane) and Freon-11 (trichloromonofluoromethane) yields a satisfactory spray and appears to be an acceptable product. Insect repellents, used singly or in combination, in these aerosol preparations include 2-ethyl-1, 3-hexanediol, dimethyl phthalate, Indalone, and dimethyl carbate. No difficulty was encountered with these materials, but storage stability tests were not run.

From time to time, reports have appeared in the medical literature concerning the use of internal insect repellents. A decade ago, for example, Eder[35] reported on the successful use of thiamine chloride given internally as a preventive for flea bites. His use of the vitamin was based on an earlier report of its successful employment in the prevention of mosquito bites.

More recently, Lunsford[36] administered thiamine intramuscularly to a number of subjects to determine the repellent action of this material on fleas. His experiments indicated that at first the fleas are repelled but later feed and die when planted on patients given thiamine.

Lunsford also experimented with quinine sulfate as an internal repellent against fleas. The insects were fed on four subjects given five grains of the drug three times daily for three days. At the end of 36 hours, 90 per cent of the fleas were dead.

The newest addition to this list of internal repellents is an orally administered preparation containing an extract of the stavesacre plant as its active ingredient. Called Bite-Ban, the preparation is said to protect about 70 per cent of the users from mosquitoes, while the remaining 30 per cent seem to suffer very little irritation from the bites. It is claimed that, after absorption, the drug sets up a temporary immunity that lasts from 12 hours to several days.

Although a tremendous amount of work has been done in the field of insect repellents, it is evident that this is an area in which further investigation will yield

good returns. In aiming toward the ideal product, research workers will continue to develop better, more efficient and acceptable insect repellents.

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THE PERFUME UNDERGROUND

(Continued from page 757)

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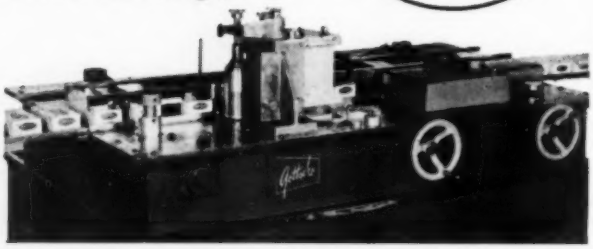

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It must be a source of amazement to the uninitiated to discover how quickly and easily enterprises of this sort can accumulate a large staff of house-to-house agents. As anyone who has slight contact with this field knows, it takes many years with a highly developed technique to build up a staff of house-to-house agents. Even with the longest, most reputable and best established companies the rate of turnover of these agents is the principal problem in this kind of business. And yet these shadow companies seem to be able to line up literally thousands of canvassers within a period of a week or two to peddle these misrepresented, dishonest products. It is not a pretty thought this situation exists, and it is certainly a serious problem for the honest house-to-house people.

The companies that enter this subterranean perfume field will not have an easy time this year. The Better Business Bureau is alert in every community watching for them. Newspapers and retailers have been alerted through letters from manufacturers. Retailers have also been alerted through an article in BEAUTY FASHION to take leadership in their community in seeing that the local Police Department as well as local newspaper editors are on guard and ready to take action at the first sign of one of these canvassers. In addition, the industry is prepared to seize upon any form of fraud or any misrepresentation in advertising, labelling, packaging or anything else to bring down on the heads of those people a suitable Government bureau.

There will be some of this underground perfume business this year. It is doubtful, however, that it will reach the more than five million dollars' worth of consumer dollars that it hit last year.

PHARMACEUTICAL RESEARCH

(Continued from page 759)

them adequately—something that is close to impossible. In this past election New York State voters approved another huge appropriation for the construction of more mental hospitals. In fact it was recently stated that from present indications, one out of every ten people will spend at least some time in a mental hospital.

Aside from the fact that these various types of products, as they are initially discovered by one or a few and then developed by many, are a most potent force in the growth of the pharmaceutical manufacturing industry, there is also the fact that the discovery of drugs for successful treatment of diseases that heretofore had defied control is also a potent factor in the

growth of this industry. And it matters not if these new products for the treatment of hitherto uncontrollable disease comes from a previously discovered class of drug products, or if one or more of them usher in an entirely new concept of therapeutic agent.

The pharmaceutical manufacturing industry of this country as a rule needs little more than a clue to send their research into high gear and to come up with a large number of products, many of which often represent marked improvements over the product which gave them the clue. As examples, it was sufanilamide from Germany which set research in the country off to the discovery of many sulfa drugs far more valuable than sulfanilamide. Similarly it was gramicidin and tyrothricin, discovered by Dubos, which touched the hunt for antibiotics. It was the synthesis of Kendall's compound E (cortisone) by Merck that loosed a flood of intensive research in the field of steroid hormones.

Most always, no matter what the source of a new drug or a new type of drug, the research problem becomes chemical in nature. This is why great efforts were made to determine the chemical structure of the various antibiotics after they were discovered. From the project to determine the chemical structure of Terramycin and Aureomycin, Pfizer researchers found that they both had the same basic molecular structure. Calling this part of the molecule tetracycline, Pfizer announced that Terramycin is oxytetracycline and Aureomycin is chlortetracycline. Then by removing the chlorine from the chlortetracycline, Pfizer had chemically produced an entirely new antibiotic drug.

Now American Cyanamid Company (parent of Lederle) scientists has broken ACTH down into eight equally active components and has determined the chemical structure of the most abundant one, which in itself can perform all the functions of ACTH. These scientists report that beta ACTH contains 39 amino acids and has a molecular weight of 4,566, being the largest single protein chain the structure of which has been determined.

The determination of the molecular structure of these drugs gives scientists an insight into possible synthesis of them, but more than that, it affords scientists an opportunity to change the molecules by subtraction or addition of atoms or groups of atoms in the likelihood that superior new products can be created.

Since the future growth of this industry depends upon research, one can realize that there are many roads to be followed. However, the great problem facing those responsible for research, and the results which it produces, is the road to follow for the best results. Shall a company direct its major effort toward discovery of new and improved products in an already well-tilled class of products, shall it tackle research from the angle of disease to be controlled, or shall it direct its efforts toward a combination of both? Or shall the company follow a completely different road that promises to lead to the discovery of an entirely new class of products which will eventually give the entire industry a real surge forward?

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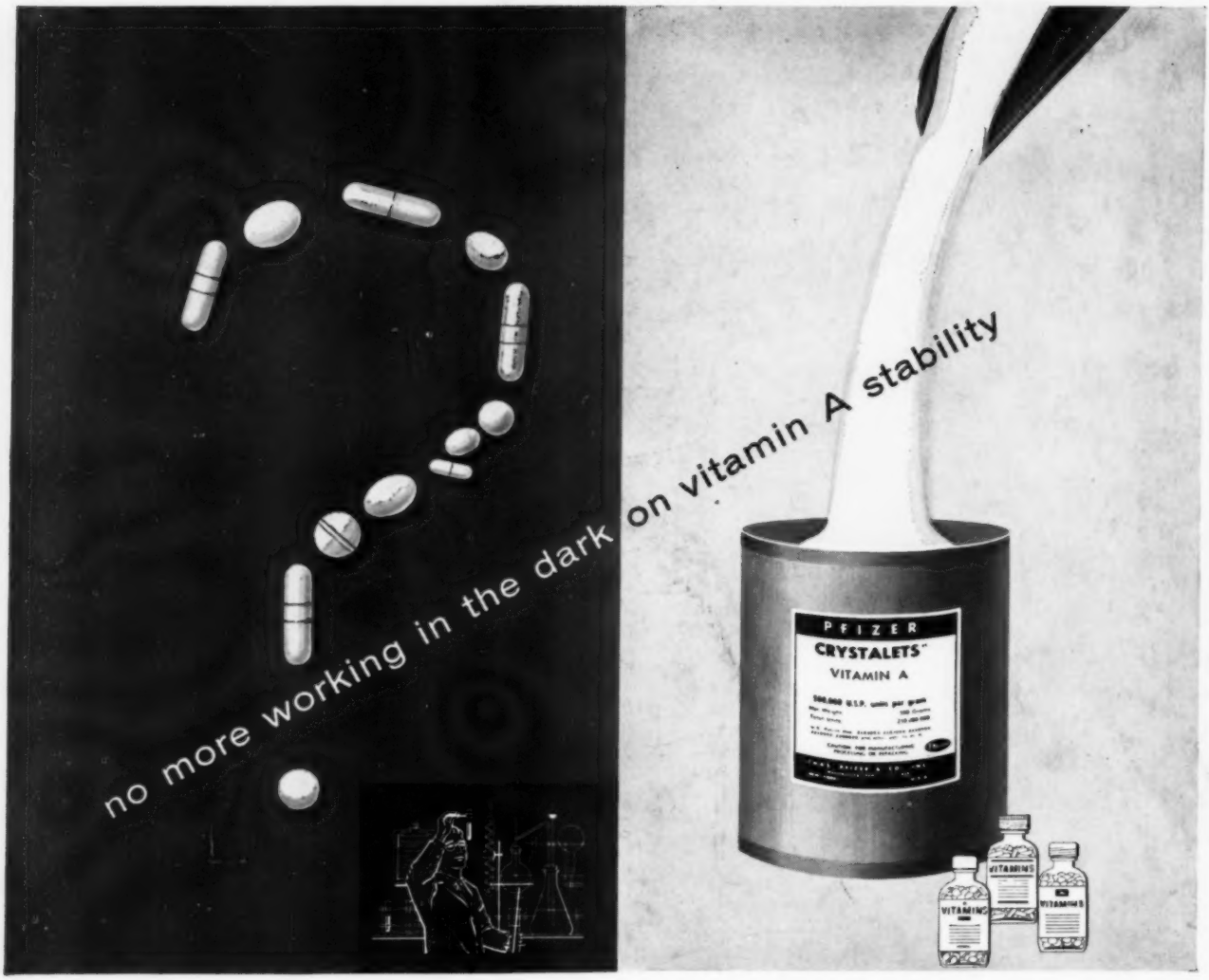

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